Watershed Data Base: Barkley Sound, Vancouver Island

T. G. Brown, I. V. Williams, and A. Langston

Department of Fisheries and Oceans
Fisheries Research Branch
Cultus Lake Salmon Research Laboratory
4222 Columbia Valley Highway
Cultus Lake, British Columbia V0X 1H0

August 1987

Canadian Data Report of Fisheries and Aquatic Sciences No. 667

Fisheries and Oceans Pêches et Océans

Canada

88-02919/

Canadian Data Report of Fisheries and Aquatic Sciences

Data reports provide a medium for filing and archiving data compilations where little or no analysis is included. Such compilations commonly will have been prepared in support of other journal publications or reports. The subject matter of data reports reflects the broad interests and policies of the Department of Fisheries and Oceans, namely, fisheries and aquatic sciences.

Data reports are not intended for general distribution and the contents must not be referred to in other publications without prior written authorization from the issuing establishment. The correct citation appears above the abstract of each report. Data reports are abstracted in *Aquatic Sciences and Fisheries Abstracts* and indexed in the Department's annual index to scientific and technical publications.

Numbers 1–25 in this series were issued as Fisheries and Marine Service Data Records. Numbers 26–160 were issued as Department of Fisheries and the Environment, Fisheries and Marine Service Data Reports. The current series name was introduced with the publication of report number 161.

Data reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page. Out-of-stock reports will be supplied for a fee by commercial agents.

Rapport statistique canadien des sciences halieutiques et aquatiques

Les rapports statistiques servent à classer et à archiver les compilations de données pour lesquelles il y a peu ou point d'analyse. Ces compilations auront d'ordinaire été préparées à l'appui d'autres publications ou rapports. Les sujets des rapports statistiques reflètent la vaste gamme des intérêts et des politiques du ministère des Pêches et des Océans, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports statistiques ne sont pas destinés à une vaste distribution et leur contenu ne doit pas être mentionné dans une publication sans autorisation écrite préalable de l'établissement auteur. Le titre exact paraît au-dessus du résumé de chaque rapport. Les rapports statistiques sont résumés dans la revue *Résumés des sciences aquatiques et halieutiques*, et ils sont classés dans l'index annuel des publications scientifiques et techniques du Ministère.

Les numéros 1 à 25 de cette série ont été publiés à titre de relevés statistiques, Services des pêches et de la mer. Les numéros 26 à 160 ont été publiés à titre de rapports statistiques du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 161.

Les rapports statistiques sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Canadian Data Report of

Fisheries and Aquatic Sciences No. 667

August 1987

WATERSHED DATA BASE: BARKLEY SOUND, VANCOUVER ISLAND

by

T. G. Brown, I. V. Williams, and A. Langston

Department of Fisheries and Oceans

Fisheries Research Branch

Cultus Lake Salmon Research Laboratory

4222 Columbia Valley Highway

Cultus Lake, British Columbia V0X 1H0

(c) Minister of Supply and Services Canada 1987

Cat. No. Fs 97-13/667E ISSN 0706-6465

Correct citation for this publication:

Brown, T. G., I. V. Williams, and A. Langston. 1987. Watershed data base: Barkley Sound, Vancouver Island. Can. Data Rep. Fish. Aquat. Sci. 667: 143 p.

TABLE OF CONTENTS

	Page
ABSTRACT	iv
INTRODUCTION	1
INFORMATION SOURCES	2
STANDARDS USED	
1. LOCATION AND ACCESS INFORMATION	3
2. PHYSICAL VARIABLES	5
3. FORESTRY AND FISHERIES INFORMATION	7
REFERENCES	8
APPENDIX I	11
APPENDIX II	13
APPENDIX III	15

ABSTRACT

Brown, T. G., I. V, Williams, and A. Langston.1987. Watershed data base: Barkley Sound, Vancouver Island. Can. Data Rep. Fish. Aquat. Sci. 667: 143 p.

Catalogue of 64 Barkley Sound streams which provides information on: location, physical characteristics, forest cover, tenure status, biogeoclimatic variants and relative abundance of salmonid species. This catalogue was designed to provide a single source of the information considered essential to initial practical study designs for future fish/forestry research.

RESUME

Brown, T. G., I. V, Williams, and A. Langston. 1987. Watershed data base: Barkley Sound, Vancouver Island. Can. Data Rep. Fish. Aquat. Sci. 667: 143 p.

Le présent catalogue porte sur 64 cours d'eau se déversant dans la baie Barkley et contient les données suivantes: situation géographique, caractéristiques physiques, couverture végétale, situation du terme, variantes biogéoclimatiques et abondance relative des salmonidés. Ce catalogue se veut une source unique d'informations considérées essentielles à la mise en oeuvre de projets de recherches pratiques en ichtyologie et en sylviculture.

INTRODUCTION

British Columbia's watersheds support both fish and forest based resource values. Forest activities such as road construction, timber removal, and silvicultural practises have the potential of impacting salmonid production. It is essential that basic forestry related information be made available on a watershed by watershed basis. This report integrates an individual watershed's physical characteristics with it's logging history and salmonid escapements. Information on sixty-four watersheds located within Barkley Sound was collected (Figure 1).

A data base formatted in this manner provides a single source of information which aids habitat research and management; and specifically fish/forestry research. Sound, practical study designs can be formulated and stream study pairs or watersheds having a variety of harvesting dates, can be identified quickly.

This data base will aid in determining the applicability of findings from the Carnation Creek experimental project (Hartman 1982) to other watersheds. Other watersheds having similar physical characteristics, salmonid escapements or harvesting histories can be identified. Biological processes within these watersheds can be examined and compared to the processes observed within Carnation Creek.

The watersheds listed within this report can be subjectively grouped based on their similar features. Management decisions can be based on those features of a watershed which have been deemed to cause a known response in another similar featured watershed. Groups of watersheds that will be subjected to similar forestry practices in the near future (e.g. harvesting of second growth timber) can be identified and decisions can be made on a group of watersheds rather than on single watersheds.

This report was designed to be a general over-view of the area examined. Information contained within this report varies in its accuracy depending on its sources. Specific variables have been measured to varying degrees of precision from watershed to watershed.

INFORMATION SOURCES

Information and data contained within this report were obtained from the following sources:

1. General information on stream location, orientation and physical characteristics were obtained from topographical maps supplied by Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa. A scale of 1:50,000 was used in most cases.

2. Forest cover information, including: date and area of cut or re-establishment of stands, tenure status, and length of roads were obtained from forest cover maps supplied by B. C. Forest Service and MacMillan Bloedel Ltd. All estimates of area were obtained with a polar compensating planimeter.

3. A map entitled "Biogeoclimatic Units of the Vancouver Forest Region" supplied by the Province of British Columbia, Ministry of Forest Branch was used to establish the primary and secondary biogeoclimatic variants of each watershed. A further description of these units is given by Klinka et al. (1979) and Klinka et al. (1984).

4. Salmonid escapements were estimated from existing fisheries escapement records, from publications containing escapement values (Brown et al. 1979), and through consultation with fisheries officers.

STANDARDS USED

LOCATION AND ACCESS INFORMATION

Each watershed's location, study accessibility, map reference numbers and tenure status is recorded in Table 1. The column labels correspond to:

1. NO — Number given to each watershed, based on alphabetical order of stream name.

2. NAME — Name as given by Brown et al. 1979

3. RIVER — If a named watershed is a tributary of another river, then that river is given under this heading. If a named watershed flows directly into the ocean then the river is designated as "NONE".

4. SPECIFIC — A named body of salt-water into which a river or stream flows.

5. LAT — The latitude of the estuary or most downstream section of a watershed.

6. LONG — The longitude of the estuary or most downstream section of a watershed.

7. CODE — The numbers 0 to 4 indicate the relative ability of persons to enter and travel within a watershed. These numbers correspond to:

VALUE	DESCRIPTION
0	No roads entering watershed and no roads within watershed. Access is by boat or plane only.
1	No roads entering watershed. Only a small portion of the watershed is serviced by an isolated road within the watershed.
2	No roads entering watershed, however, most of the watershed is serviced by isolated roads within the watershed.
3	Good access to the watershed by road, but only a small portion of the watershed is accessible.
4	Good access to the watershed and good access throughout the entire watershed by road.

8. TOPO — Serial number of main topographic map on which the named creek or river can be located.

9. COVER — The serial number of the main forest cover map on which the named creek or river can be located.

10. TFL — The percentage of the area within a watershed which is considered to be Tree Farm Licence. With the Barkley Sound region all land designated as T.F.L. will be within the "Alberni" T.F.L. 44, administered by MacMillan Bloedel Ltd.

11. DEED — This designation includes all privately owned land including Mineral leases, and lands considered parks. The status of forest cover and cutting histories are unknown.

12. INDIAN — This designation includes the percentage of a watershed which is Indian Reserve. In an Indian Reserve is located within a watershed and is less than 1% of that watersheds total area, it is still designated as 1%. The status of forest cover and cutting histories are unknown.

13. TSA — This designation includes all forest land other than those considered to be Tree Farm Licences. Timber Supply Areas, are administered by the B. C. Forest Service.

PHYSICAL VARIABLES

The physical characteristics of each of the watersheds are outlined in Table 2. The column labels correspond to:

1. NO — As indicated.

2. NAME — As indicated.

3. ORIENTATION — General compass direction from upper elevation to lower elevations. Thus, a stream which has its headwaters in the north and estuary in the south would be described as "N-S".

4. PRIMARY — A biogeoclimatic variant, portrays the relationship between ecosystems and climate. Watersheds with similar biogeoclimatic variants will have a similar climate and a similar vegetative association at climax. The zones, subzones and variants are listed below and are further described by Klinka et al. (1984).

ZONES	SUBZONES	VARIANT	SYMBOL
Coastal Douglas Fir	Drier CDF		CFa
	Wetter CDF		CFb
Coastal Western Hemlock	Drier Maritime CWH	Vancouver Island	Ha1
		Pacific Ranges	Ha2
	Wetter CWH	Windward Submontane Maritime	Hb1
		Windward Montane Maritime	Hb2
		Leeward Submontane Maritime	Hb3
		Leeward Montane Maritime	Hb4
		Southern Submaritime	Hb5
		Central Submaritime Lower	Hb6
		Central Submaritime Upper	Hb7
	Drier Submaritime CWH	Southern	Hc1
		Central	Hc2
	Hypermaritime CWH	Southern	Hd1

5. SECONDARY — A biogeoclimatic variant which covers a smaller percentage of the watershed then does the primary biogeoclimatic variant.

6. DRAINAGE — Watershed area including lakes, given in km^2.

7. LAKE AREA — Area of all lakes in km^2.

8. TOTAL — Total length of a stream or river, in km, estimated from forest cover maps.

9. ACCESS — Length of stream or river in km that is accessible to anadromous fish.

10. GRAD — Gradient of stream within accessible length. Calculated from topographic maps.

11. MAX — The highest point within a watershed in meters.

12. ORDER — The stream order of the watershed.

13. TRIBS — The number of tributaries within the accessible length.

FORESTRY AND FISHERIES INFORMATION

The location of all 64 of the watersheds is indicated in Figure 1. Forestry and fisheries resource information is illustrated for each watershed (Appendix I). A description of each of the charts and graphs is given below.

1. CUT HISTORY (Bar Graph)

Year of harvest or year of re-establishment of forest cover is indicated as both number of hectares cut and by percentage of the entire watershed affected.

2. PERCENT OF WATERSHED (Pie Chart)

The percentages of the watershed which should be represented by a specific successional stage were calculated from current forest cover maps. These are as follows:

AGE	STAGE
0 - 15	Recent Clear-cut
6 - 15	Early Successional
16 - 30	Young Immature Poles
31 - 50	Pre-Commercial Poles
51 +	Second Growth
Uncut	Old Growth

3. FISH SPECIES (Bar Graph)

The escapement values for each of the five Pacific Salmon species and Steelhead trout are indicated. The population size index, refers to:

INDEX VALUE	DESCRIPTION
0	No fish observed
1	Present some years only
2	1 - 100
3	100 - 1,000
4	1,000 - 10,000
5	+ 10,000

REFERENCES

Brown, R.F., M.M. Musgrave, D.G. Demontier, D.W. Marshall and M.J. Comfort. 1979. Catalogue of salmon streams and spawning escapements of statistical areas 22 and 23 (Nitnat and Barkley Sound). Canadian Data Report of Fisheries and Aquatic Sciences, No. 167. 191p.

Hartman, G. 1982 (ed.). Proceedings of the Carnation Creek workshop, a 10 year review. Malaspina College, Nanaimo, B. C. February 24-26, 1982. 404p.

Klinka, K., F.C. Nuszdorfer and L. Skoda. 1979. Biogeoclimatic units of central and southern Vancouver Island. Province of British Columbia, Ministry of Forests, Victoria, B. C. 120p.

Klinka, K., R.N. Green, P.J. Courtin and F.C. Nuszdorfer. 1984. Site diagnosis, tree species selection and slash burning guidelines for the Vancouver forest region. Province of British Columbia, Ministry of Forests, Land Management Report No. 25. 177p.

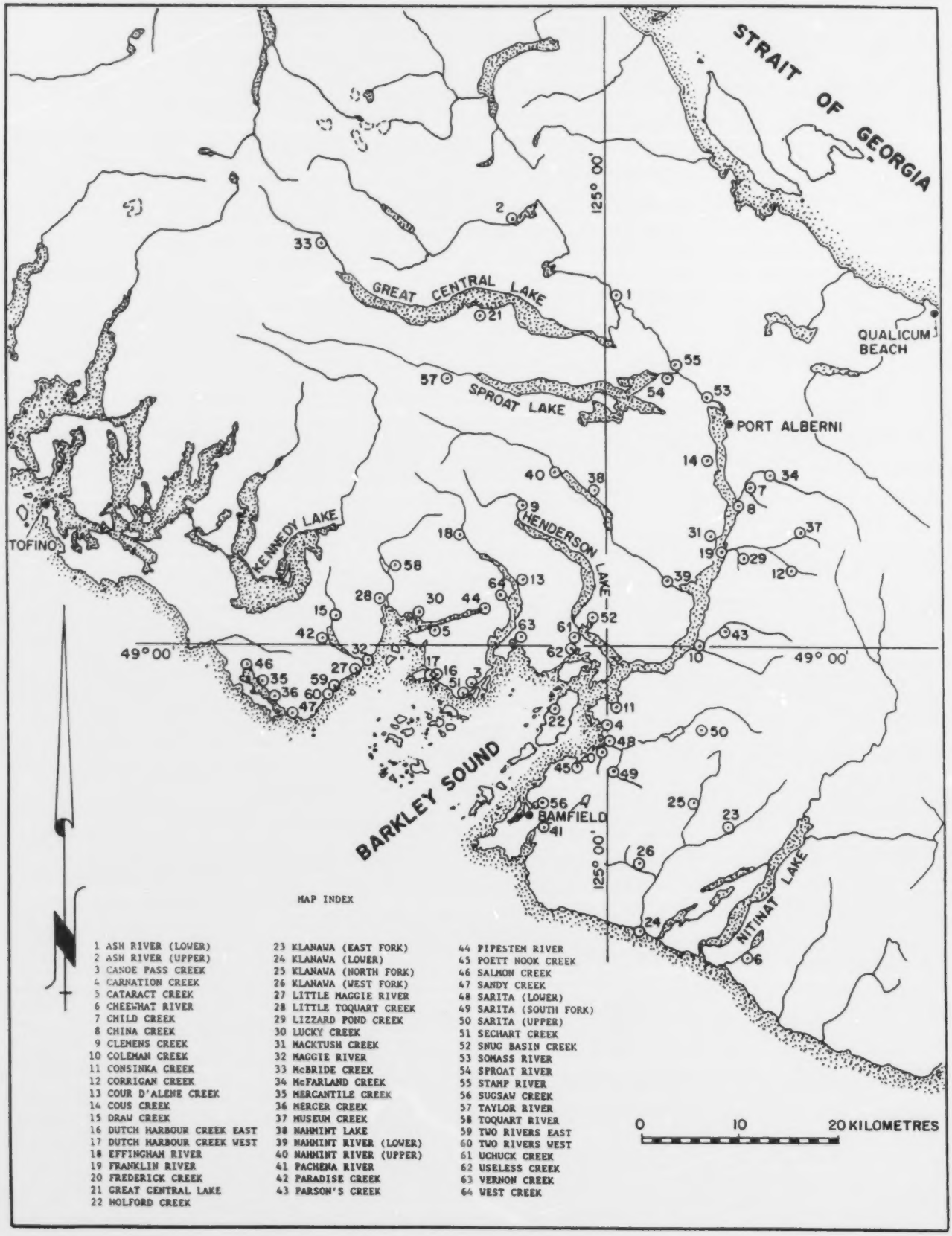


Figure 1. Map of Barkley Sound

APPENDIX I. BARKLEY SOUND STREAMS; LOCATION AND ACCESS INFORMATION

NO	NAME	RIVER	LOCATION			ACCESS	MAP		TENURE			
			SPECIFIC	LAT	LONG	CODE	TOPO	COVER	TFL	DEED	INDIAN	TSA
1	ASH RIVER (LOWER)	STAMP RIVER	ALBERNI INLET	49.25	125.02	4	92F/SW	92F.035	72%	14%	0%	14%
2	ASH RIVER (UPPER)	ASH RIVER (LOWER)	ALBERNI INLET	49.27	125.09	4	92F/SW	92F.044	64%	36%	0%	0%
3	CANOE PASS CREEK	NONE	SECHART CHANNEL	48.58	125.13	0	92C/NW	92F.004	0%	0%	0%	100%
4	CARNATION CREEK	NONE	NUMUKAMIS BAY	48.55	125.00	4	92C/NE	92C.096	99%	0%	1%	0%
5	CATARACT CREEK	NONE	TOQUART BAY	49.00	125.14	1	92C/NW	92F.004	0%	0%	0%	100%
6	CHEEWHAT RIVER	NONE	NONE	48.40	124.49	0	92C/NE	92C.066	78%	10%	2%	10%
7	CHILD CREEK	CHINA CREEK	ALBERNI INLET	49.10	124.46	3	92F/SE	92F.017	98%	0%	0%	2%
8	CHINA CREEK	NONE	ALBERNI INLET	49.09	124.47	4	92F/SE	92F.017	100%	0%	0%	0%
9	CLEMENS CREEK	HENDERSON RIVER	ALBERNI INLET	49.09	125.08	0	92F/SW	92F.015	100%	0%	0%	0%
10	COLEMAN CREEK	NONE	ALBERNI INLET	49.00	124.51	4	92C/NE	92C.096	100%	0%	0%	0%
11	CONSINKA CREEK	NONE	ALBERNI INLET	48.56	124.59	4	92C/NE	92C.096	100%	0%	0%	0%
12	CORRIGAN CREEK	FRANKLIN RIVER	ALBERNI INLET	49.06	124.44	3	92F/SE	92F.007	99%	1%	0%	0%
13	COUR D'ALENE CREEK	NONE	EFFINGHAM INLET	49.04	125.50	2	92F/SW	92F.005	97%	0%	3%	0%
14	COUS CREEK	NONE	ALBERNI INLET	49.12	124.50	4	92F/SE	92F.016	99%	0%	1%	0%
15	DRAW CREEK	MAGGIE RIVER	NONE	49.02	125.26	4	92F/SW	92C.093	70%	0%	0%	30%
16	DUTCH HARBOUR CREEK EAST	NONE	SECHART CHANNEL	48.58	125.17	1	92C/NW	92C.004	0%	0%	0%	100%
17	DUTCH HARBOUR CREEK WEST	NONE	SECHART CHANNEL	48.58	125.17	1	92C/NW	92C.004	0%	0%	6%	94%
18	EFFINGHAM RIVER	NONE	EFFINGHAM INLET	49.07	125.14	1	92F/SW	92F.014	0%	0%	0%	100%
19	FRANKLIN RIVER	NONE	ALBERNI INLET	49.06	124.49	4	92F/SE	92F.007	98%	2%	0%	0%
20	FREDERICK CREEK	SARITA RIVER	NONE	48.53	125.00	4	92C/NW	92C.085	98%	0%	2%	0%
21	GREAT CENTRAL LAKE	STAMP RIVER	ALBERNI INLET	49.21	125.13	4	92F/SW	92F.033	89%	11%	0%	0%
22	HOLFORD CREEK	NONE	TZARTUS ISLAND	48.56	125.05	1	92C/NW	92C.095	0%	0%	0%	100%
23	KLANAWA (EAST FORK)	KLANAWA (LOWER)	NONE	48.43	124.52	3	92C/NE	92C.087	100%	0%	0%	0%
24	KLANAWA (LOWER)	NONE	NONE	48.42	124.57	3	92C/NE	92C.076	81%	9%	0%	0%
25	KLANAWA (NORTH FORK)	KLANAWA (LOWER)	NONE	48.43	124.52	3	92C/NE	92C.086	100%	0%	0%	0%
26	KLANAWA (WEST FORK)	KLANAWA (LOWER)	NONE	48.45	124.55	3	92C/NE	92C.075	100%	0%	0%	0%
27	LITTLE MAGGIE RIVER	NONE	NONE	48.59	125.24	3	92C/NW	92C.093	100%	0%	0%	0%
28	LITTLE TOQUART RIVER	NONE	TOQUART BAY	49.03	125.22	1	92F/SW	92F.004	0%	0%	2%	98%
29	LIZZARD POND CREEK	FRANKLIN RIVER	ALBERNI INLET	49.06	124.47	3	92F/SE	92F.007	100%	0%	0%	0%
30	LUCKY CREEK	NONE	TOQUART BAY	49.03	125.18	0	92F/SW	92F.004	0%	0%	0%	100%
31	MACKTUSH CREEK	NONE	ALBERNI INLET	49.07	124.50	4	92F/SE	92F.016	100%	0%	0%	0%
32	MAGGIE RIVER	NONE	NONE	48.59	125.23	3	92F/SW	92F.093	99%	0%	1%	0%
33	McBRIDE CREEK	GREAT CENTRAL LAKE	ALBERNI INLET	49.23	125.28	0	92F/SW	92F.042	93%	7%	0%	0%
34	McFARLAND CREEK	CHINA CREEK	ALBERNI INLET	49.11	124.44	4	92F/SE	92F.027	54%	12%	0%	34%
35	MERCANTILE CREEK	NONE	UCLUELET INLET	49.58	125.33	4	92C/NW	92C.093	89%	11%	0%	0%
36	MERCER CREEK	NONE	UCLUELET INLET	49.57	125.32	4	92C/NW	92C.093	15%	85%	0%	0%
37	MUSEUM CREEK	FRANKLIN	ALBERNI INLET	49.06	124.44	4	92F/SE	92F.007	100%	0%	0%	0%
38	NAHMINT LAKE	NAHMINT RIVER (LOWER)	ALBERNI INLET	49.09	124.50	2	92F/SW	92F.015	100%	0%	0%	0%
39	NAHMINT RIVER (LOWER)	NONE	ALBERNI INLET	49.04	124.54	4	92F/SE	92F.006	99%	0%	1%	0%
40	NAHMINT RIVER (UPPER)	NAHMINT LAKE	ALBERNI INLET	49.11	125.05	0	92F/SW	92F.015	100%	0%	0%	0%
41	PACHENA RIVER	NONE	PACHENA BAY	48.48	125.25	4	92C/NW	92C.085	98%	0%	2%	0%
42	PARADISE CREEK	MAGGIE RIVER	NONE	49.01	125.27	4	92F/SW	92F.093	100%	0%	0%	0%
43	PARSON'S CREEK	COLMAN CREEK	ALBERNI INLET	49.00	124.51	3	92F/SE	92F.007	100%	0%	0%	0%
44	PIPESTEM RIVER	NONE	TOQUART BAY	49.03	125.11	0	92F/SW	92F.005	0%	0%	0%	100%
45	POETT NOOK CREEK	NONE	POETT NOOK	48.53	125.02	4	92C/NW	92C.085	97%	0%	3%	0%
46	SALMON CREEK	NONE	UCLUELET INLET	48.59	125.34	4	92C/NW	92C.093	52%	47%	1%	0%
47	SANDY CREEK	NONE	NONE	48.56	125.30	4	92C/NW	92C.093	44%	51%	5%	0%
48	SARITA (LOWER)	NONE	NUMUKAMIS BAY	48.54	125.00	4	92C/NE	92C.086	83%	0%	17%	0%

APPENDIX I. BARKLEY SOUND STREAMS; LOCATION AND ACCESS INFORMATION

NO	NAME	RIVER	LOCATION SPECIFIC	LAT	LONG	ACCESS CODE	MAP TOPO	MAP COVER	TENURE TFL	DEED	INDIAN	TSA
49	SARITA (SOUTH FORK)	SARITA (LOWER)	NUMUKAMIS BAY	48.52	124.59	4	92C/NE	92C.096	100%	0%	0%	0%
50	SARITA (UPPER)	SARITA (LOWER)	NUMUKAMIS BAY	48.55	124.51	4	92C/NE	92C.096	100%	0%	0%	0%
51	SECHART CREEK	NONE	SECHART CHANNEL	48.58	125.15	0	92C/NW	92C.004	0%	0%	0%	100%
52	SNUG BASIN CREEK	NONE	ALBERNI INLET	49.02	125.01	2	92F/SW	92F.005	76%	24%	0%	0%
53	SOMASS RIVER	NONE	ALBERNI INLET	49.16	124.50	4	92F/SE	92F.026	53%	32%	4%	11%
54	SPROAT RIVER	SOMASS RIVER	ALBERNI INLET	49.16	124.57	4	92F/SE	92F.026	*	*	*	*
55	STAMP RIVER	SOMASS RIVER	ALBERNI INLET	49.18	124.53	4	92F/SE	92F.036	37%	62%	1%	0%
56	SUGSAW CREEK	NONE	BAMFIELD INLET	48.50	125.06	4	92C/NW	92C.085	99%	0%	1%	0%
57	TAYLOR RIVER	SPROAT RIVER	ALBERNI INLET	49.17	125.15	4	92F/SW	92F.024	100%	0%	0%	0%
58	TOQUART RIVER	NONE	TOQUART BAY	49.05	125.20	1	92F/SW	92F.004	0%	0%	1%	99%
59	TWO RIVERS EAST	NONE	NONE	48.57	125.27	4	92C/NW	92C.093	98%	0%	2%	0%
60	TWO RIVERS WEST	NONE	NONE	48.57	125.27	4	92C/NW	92C.093	93%	0%	7%	0%
61	UCHUCK CREEK	NONE	UCHUCKLESIT INLET	49.01	125.03	2	92F/SW	92F.005	89%	0%	0%	11%
62	USELESS CREEK	NONE	ALBERNI INLET	49.00	125.04	2	92C/NW	92F.005	100%	0%	0%	0%
63	VERNON CREEK	NONE	VERNON BAY	49.01	125.08	2	92F/SW	92F.005	0%	0%	0%	100%
64	WEST CREEK	NONE	EFFINGHAM INLET	49.03	125.10	2	92F/SW	92F.005	10%	0%	0%	90%

APPENDIX II. BARKLEY SOUND STREAMS; PHYSICAL VARIABLES

NO	NAME	BIOGEOCLIMATIC VAR. PRIMARY	BIOGEOCLIMATIC VAR. SECONDARY	ORIENTATION	AREA (sq.m) DRAINAGE	AREA (sq.m) LAKE	LENGTH (km) TOTAL	LENGTH (km) ACCESS	ELEVATION GRAD	ELEVATION MAX (m)	ORDER	TRIBS
1	ASH RIVER (LOWER)	Ha1	Hb4	N-S	137.4	2.71	24.0	4.0	1%	1479	5	2
2	ASH RIVER (UPPER)	Hb3	Hb4	W-E	196.7	10.00	27.0	0.0	0%	1655	4	0
3	CANOE PASS CREEK	Hd1	Hb1	N-S	3.5	0.06	3.2	1.8	3%	700	2	3
4	CARNATION CREEK	Hb1	Hd1	E-W	9.8	0.00	7.2	3.2	1%	850	3	3
5	CATARACT CREEK	Hd1	Hb1	E-W	16.1	1.83	6.0	0.4	3%	1000	4	1
6	CHEEWHAT RIVER	Hb1	Hd1	E-W	20.4	1.36	9.6	6.0	1%	1052	4	6
7	CHILD CREEK	Ha1	Hb4	E-W	11.5	0.00	5.8	3.0	7%	1240	4	3
8	CHINA CREEK	Ha1	Hb4	E-W	64.5	0.23	18.7	4.8	1%	1450	5	7
9	CLEMENS CREEK	Hb1	Hb2	N-S	37.0	0.00	10.0	5.6	2%	1300	5	5
10	COLEMAN CREEK	Ha1	Hb4	E-W	44.9	0.10	14.8	13.0	2%	1393	4	16
11	CONSINKA CREEK	Hb1	Hb2	E-W	14.0	0.56	9.6	0.1	4%	886	3	0
12	CORRIGAN CREEK	Ha1	Hb4	W-E	57.5	0.00	17.4	0.5	3%	1340	5	0
13	COUR D'ALENE CREEK	Hb1	Hb2	E-W	20.3	0.01	10.2	1.5	4%	1091	4	0
14	COUS CREEK	Ha1	Hb3	W-E	74.9	0.00	18.0	11.3	2%	1150	5	15
15	DRAW CREEK	Hb1	NONE	N-S	40.0	0.42	10.0	8.2	4%	933	4	15
16	DUTCH HARBOUR CREEK EAST	Hd1	Hb1	E-W	2.7	0.00	4.0	3.2	4%	450	2	0
17	DUTCH HARBOUR CREEK WEST	Hd1	Hb1	E-W	1.7	0.00	2.3	0.8	2%	100	2	0
18	EFFINGHAM RIVER	Hb1	Hb2	N-S	50.9	0.00	15.8	7.2	2%	1500	4	14
19	FRANKLIN RIVER	Ha1	Hb4	W-E	42.6	0.14	16.6	2.8	3%	1450	6	5
20	FREDERICK CREEK	Hb1	Hd1	S-N	17.5	0.41	10.8	4.0	1%	800	4	5
21	GREAT CENTRAL LAKE	Ha1	Hb3	W-E	332.2	53.23	44.8	35.0	0%	1862	5	53
22	HOLFORD CREEK	Hd1	Hb1	S-N	2.1	0.10	1.8	0.2	6%	200	3	1
23	KLANAWA (EAST FORK)	Hb1	Hb2	E-W	53.4	0.05	19.0	8.0	1%	900	5	12
24	KLANAWA (LOWER)	Hb1	Hd1	N-S	56.8	0.52	13.6	13.6	1%	750	6	20
25	KLANAWA (NORTH FORK)	Hb1	Hb2	N-S	69.5	0.28	17.4	6.4	1%	850	5	18
26	KLANAWA (WEST FORK)	Hb1	Hb2	W-E	53.0	0.05	14.0	11.0	1%	800	5	40
27	LITTLE MAGGIE RIVER	Hd1	Hb1	N-S	5.6	0.05	4.4	0.4	2%	250	2	0
28	LITTLE TOQUART CREEK	Hd1	Hb1	N-S	19.6	0.60	8.4	2.7	2%	700	4	3
29	LIZZARD POND CREEK	Ha1	Hb2	S-N	11.6	0.22	6.9	2.0	6%	850	3	3
30	LUCKY CREEK	Hb1	Hb2	N-S	36.6	0.75	13.4	0.8	4%	1251	4	0
31	MACKTUSH CREEK	Hb3	Hb1	W-E	27.2	0.00	12.4	8.5	5%	1000	4	22
32	MAGGIE RIVER	Hd1	Hb1	N-S	16.0	2.40	6.0	2.5	1%	650	5	9
33	McBRIDE CREEK	Hb3	Hb4	W-E	71.0	0.80	19.0	8.0	2%	1743	5	5
34	McFARLAND CREEK	Ha1	Hb4	N-S	25.2	0.28	8.3	0.0	0%	1050	3	0
35	MERCANTILE CREEK	Hd1	Hb1	E-W	12.3	0.00	9.0	0.2	1%	700	3	0
36	MERCER CREEK	Hd1	NONE	E-W	2.2	0.06	2.0	0.8	1%	100	2	0
37	MUSEUM CREEK	Ha1	Hb4	W-E	28.0	0.00	9.4	0.0	0%	1460	5	0
38	NAHMINT LAKE	Hb1	Hb2	W-E	48.4	7.10	13.9	13.9	0%	1259	6	18
39	NAHMINT RIVER (LOWER)	Hb1	Hb2	W-E	50.4	0.06	12.8	4.8	1%	1250	6	13
40	NAHMINT RIVER (UPPER)	Hb1	Hb2	W-E	93.0	0.82	20.8	14.0	1%	1642	6	7
41	PACHENA RIVER	Hd1	Hb1	E-W	44.2	0.85	12.8	8.9	1%	800	5	12
42	PARADISE CREEK	Hb1	NONE	W-E	15.5	0.10	6.5	3.0	5%	650	4	5
43	PARSON'S CREEK	Ha1	Hb4	E-W	39.0	0.15	14.5	2.4	2%	1300	4	3
44	PIPESTEM RIVER	Hb1	Hd1	N-S	6.1	0.28	4.0	1.2	6%	550	3	0
45	POETT NOOK CREEK	Hb1	Hd1	S-N	6.7	0.07	4.4	2.4	2%	657	3	3
46	SALMON CREEK	Hd1	Hb1	E-W	9.0	0.15	6.6	3.2	2%	750	3	3
47	SANDY CREEK	Hd1	Hb1	N-S	5.6	0.08	5.0	1.0	1%	600	2	1
48	SARITA (LOWER)	Hb1	Hb2	E-W	40.3	1.12	11.8	9.7	1%	850	5	11

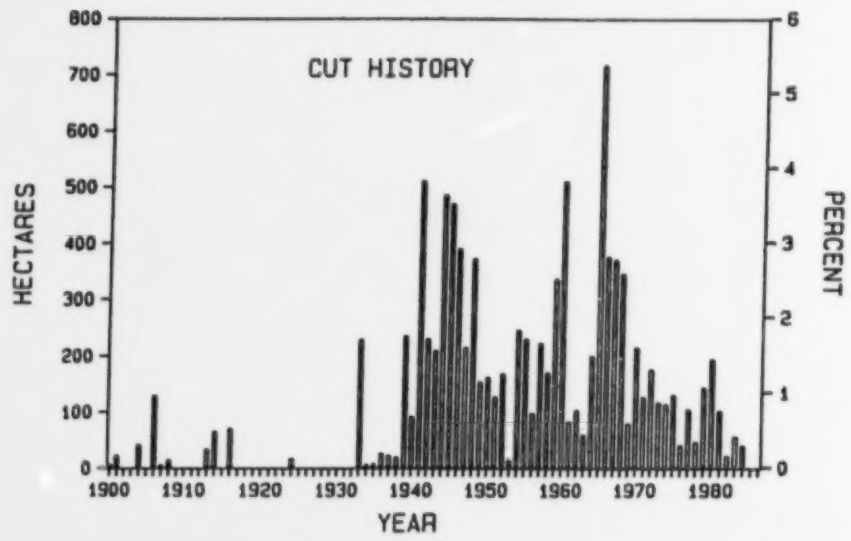
APPENDIX II. BARKLEY SOUND STREAMS; PHYSICAL VARIABLES

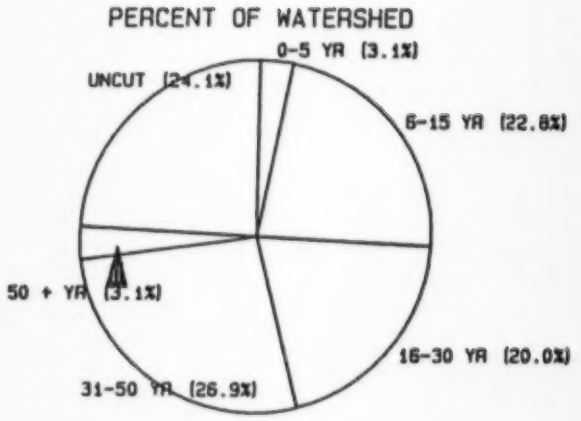
NO	NAME	BIOGEOCLIMATIC VAR. PRIMARY	SECONDARY	ORIENTATION	AREA (sq.m) DRAINAGE	LAKE	LENGTH (km) TOTAL	ACCESS	ELEVATION GRAD	MAX (m)	ORDER	TRIBS
49	SARITA (SOUTH FORK)	Hb1	Hb2	S-N	58.2	0.00	18.8	11.2	2%	800	5	13
50	SARITA (UPPER)	Hb1	Hb2	E-W	66.8	0.00	13.4	0.0	0%	800	4	0
51	SECHART CREEK	Hd1	Hb1	N-S	3.8	0.00	2.6	0.1	6%	750	2	2
52	SNUG BASIN CREEK	Hb1	NONE	N-S	8.1	0.06	5.0	1.6	3%	700	3	2
53	SOMASS RIVER	CFb	Ha1	N-S	34.4	0.31	9.0	9.0	1%	150	7	3
54	SPROAT RIVER	CFb	Ha1	W-E	192.7	45.40	25.0	25.0	1%	1642	6	42
55	STAMP RIVER	Ha1	CFb	W-E	91.8	0.80	18.2	18.2	1%	1557	6	7
56	SUGSAW CREEK	Hd1	Hb1	E-W	8.3	0.76	5.4	0.6	1%	550	2	1
57	TAYLOR RIVER	Hb3	Hb4	W-E	121.3	0.42	30.6	23.0	2%	1642	6	38
58	TOQUART RIVER	Hb1	Hd1	N-S	82.6	1.26	21.8	11.6	1%	1450	5	15
59	TWO RIVERS EAST	Hd1	Hb1	N-S	5.1	0.00	3.8	2.4	4%	700	3	2
60	TWO RIVERS WEST	Hd1	Hb1	N-S	10.3	0.00	5.8	3.2	2%	700	3	3
61	UCHUCK CREEK	Hb1	Hd1	W-E	16.0	1.10	6.5	2.4	2%	909	3	1
62	USELESS CREEK	Hd1	Hb1	E-W	5.6	0.00	5.0	0.2	5%	1000	3	0
63	VERNON CREEK	Hb1	Hd1	E-W	4.3	0.10	4.3	0.8	3%	750	3	3
64	WEST CREEK	Hb1	Hb2	W-E	12.6	0.00	6.5	1.6	6%	1198	3	3

APPENDIX III. FORESTRY CUT HISTORIES AND SALMONID ESCAPMENTS BY WATERSHED

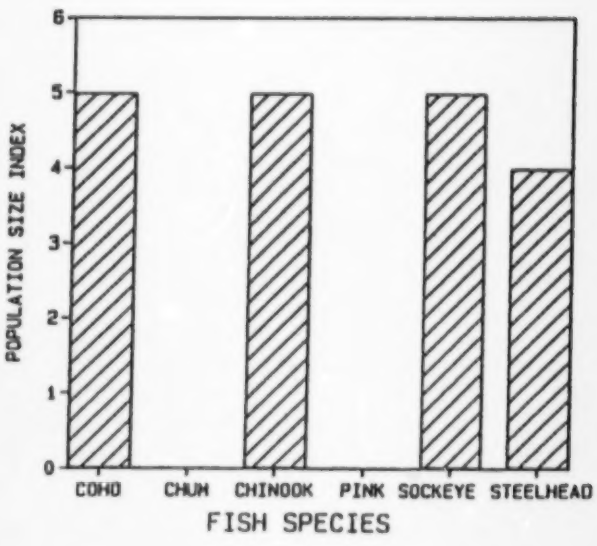
NO	NAME	NO	NAME
1	ASH RIVER (LOWER)	33	McBRIDE CREEK
2	ASH RIVER (UPPER)	34	McFARLAND CREEK
3	CANOE PASS CREEK	35	MERCANTILE CREEK
4	CARNATION CREEK	36	MERCER CREEK
5	CATARACT CREEK	37	MUSEUM CREEK
6	CHEEWHAT RIVER	38	NAHMINT LAKE
7	CHILD CREEK	39	NAHMINT RIVER (LOWER)
8	CHINA CREEK	40	NAHMINT RIVER (UPPER)
9	CLEMENS CREEK	41	PACHENA RIVER
10	COLEMAN CREEK	42	PARADISE CREEK
11	CONSINKA CREEK	43	PARSON'S CREEK
12	CORRIGAN CREEK	44	PIPESTEM RIVER
13	COUR D'ALENE CREEK	45	POETT NOOK CREEK
14	COUS CREEK	46	SALMON CREEK
15	DRAW CREEK	47	SANDY CREEK
16	DUTCH HARBOUR CREEK EAST	48	SARITA (LOWER)
17	DUTCH HARBOUR CREEK WEST	49	SARITA (SOUTH FORK)
18	EFFINGHAM RIVER	50	SARITA (UPPER)
19	FRANKLIN RIVER	51	SECHART CREEK
20	FREDERICK CREEK	52	SNUG BASIN CREEK
21	GREAT CENTRAL LAKE	53	SOMASS RIVER
22	HOLFORD CREEK	54	SPROAT RIVER
23	KLANAWA (EAST FORK)	55	STAMP RIVER
24	KLANAWA (LOWER)	56	SUGSAW CREEK
25	KLANAWA (NORTH FORK)	57	TAYLOR RIVER
26	KLANAWA (WEST FORK)	58	TOQUART RIVER
27	LITTLE MAGGIE RIVER	59	TWO RIVERS EAST
28	LITTLE TOQUART CREEK	60	TWO RIVERS WEST
29	LIZZARD POND CREEK	61	UCHUCK CREEK
30	LUCKY CREEK	62	USELESS CREEK
31	MACKTUSH CREEK	63	VERNON CREEK
32	MAGGIE RIVER	64	WEST CREEK

Ash River (Lower)

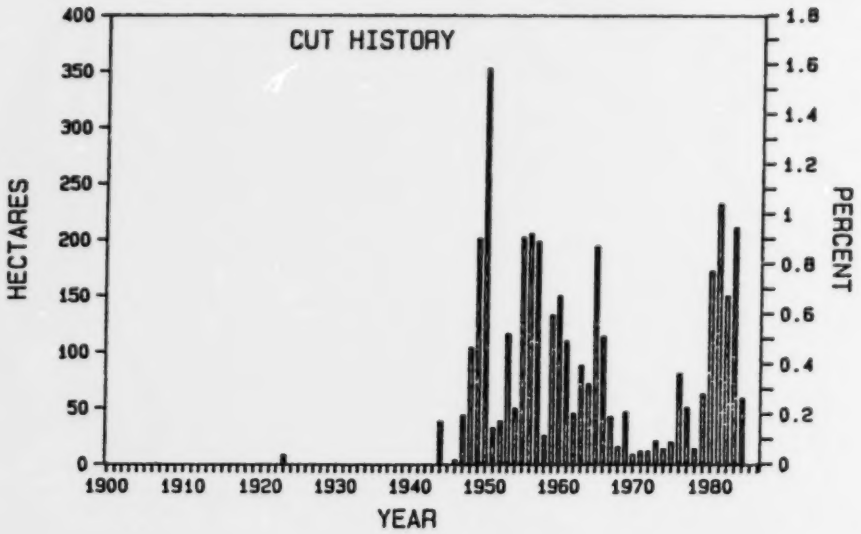


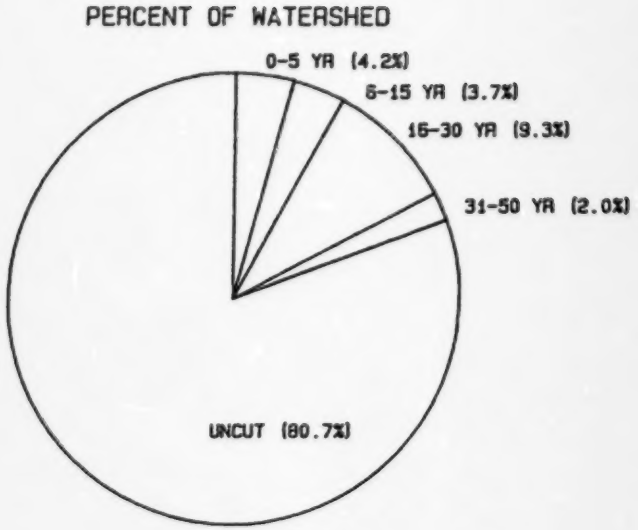


1. This section includes mouth of Elsie Lake to Stamp River. Area logged extensively by railway. Large sections logged prior to 1945. A tributary "Lanterman Creek" has large cuts on a 40% slope. Approximately 28% of watershed is deeded land or TSA and lacks cut information of the remaining land; approximately 76% has been clearcut.



Ash River (Upper)





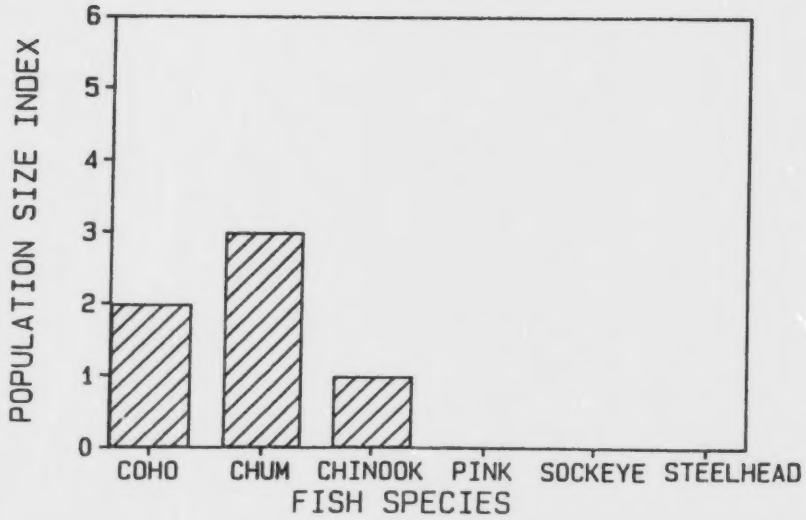
2. Section includes Elsie Lake and above. Logging heavy around Elsie Lake only. A dam exists at the mouth of Elsie Lake. Approximately 36% of watershed is in Strathcona Park.

NO FISH RECORDED

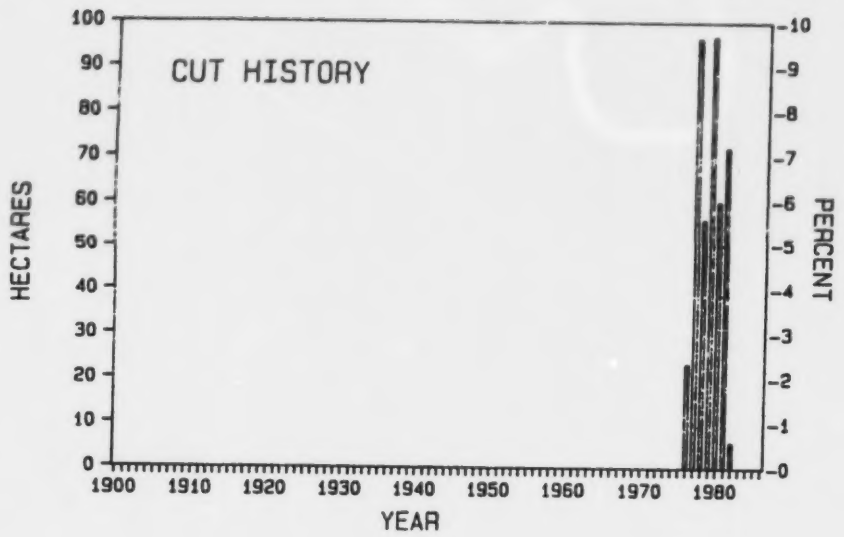
Canoe Pass Creek

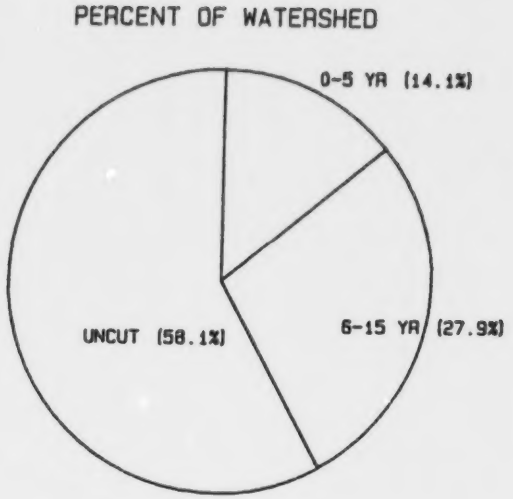
NO LOGGING HISTORY

3. At least three small swamp-lake systems which may be of interest lie within the spawnable length. Area unlogged to date. Numerous small 1^{o} tributaries with lakes enter the ocean within 1.5 km of Canoe Pass Creek's mouth. Lower section of creek is steep and bouldery while numerous old beaver dams are evident in upper sections. Small estuary is well protected.

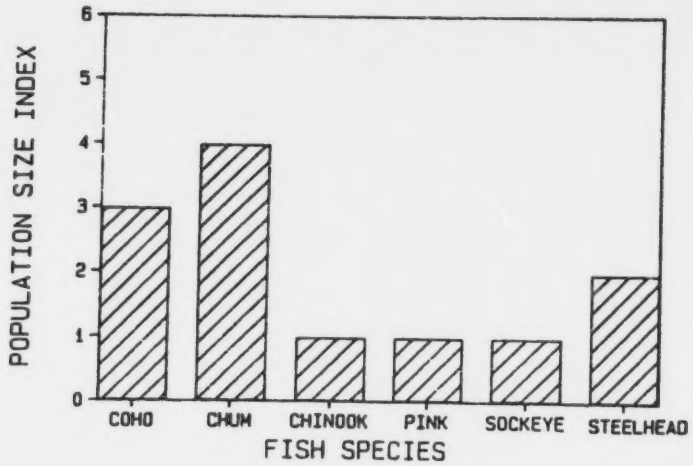


Carnation Creek

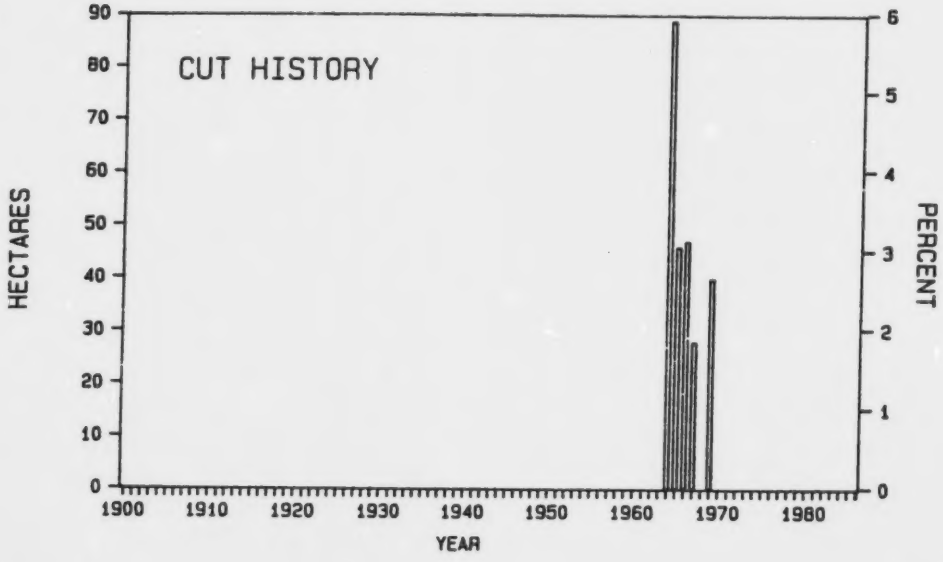


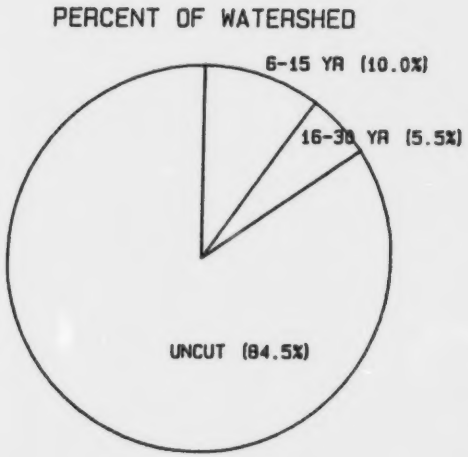


4. This stream is the site of an on-going Forestry/Fisheries study. "The Carnation Creek Watershed Project", which was initiated in 1970. Study is well documented in literature and in workshop proceedings.

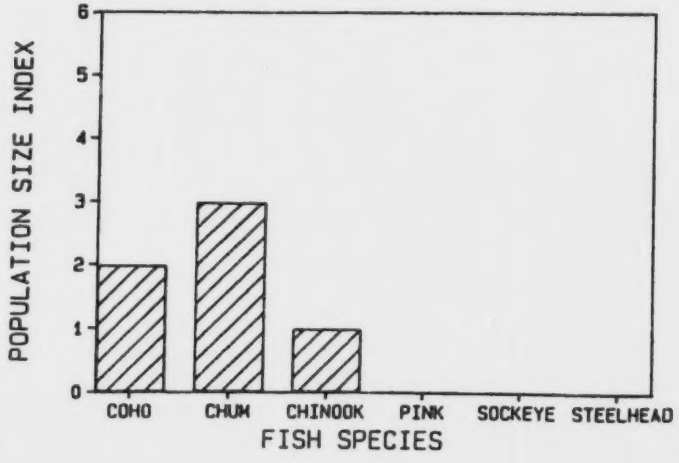


Cataract Creek





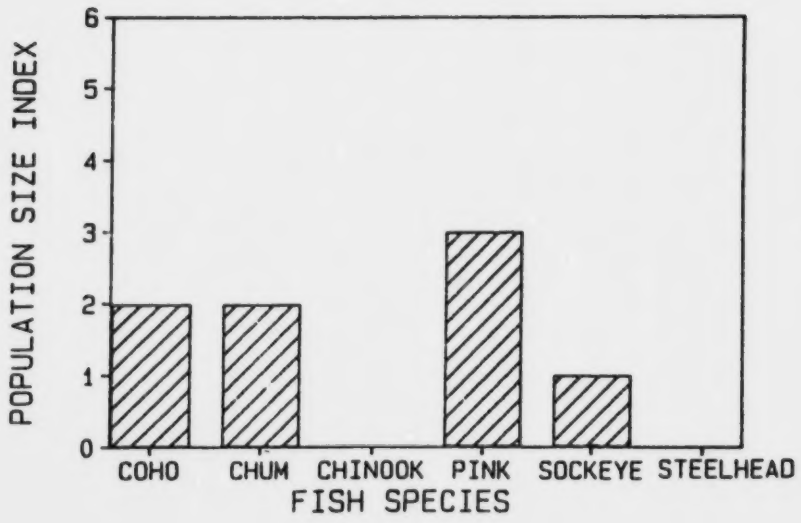
5. Only 0.4 km of spawnable length. Area above falls contains large lake (1.7 km^2) and numerous other small lakes, ponds and swamps. Majority of harvesting activity is on east side of lake and took place in 1964-69.



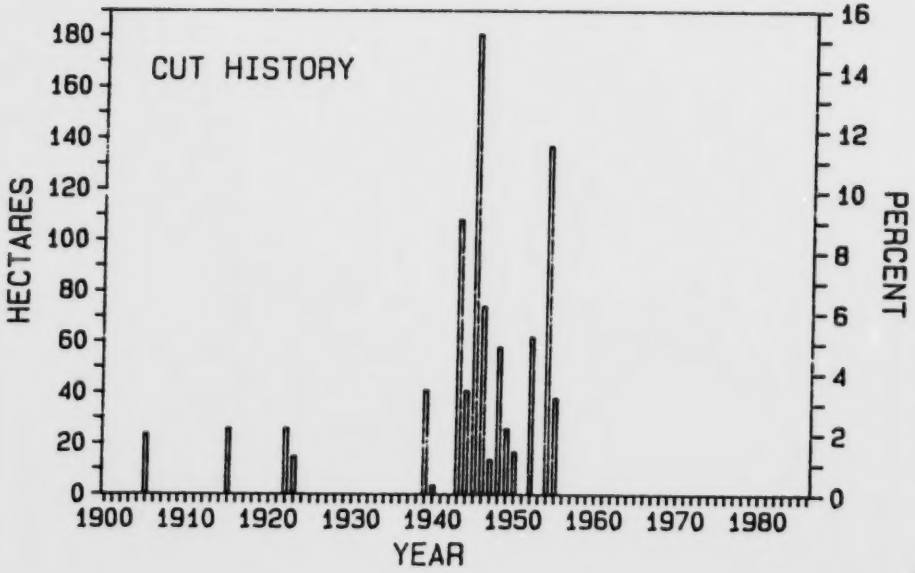
Cheewhat River

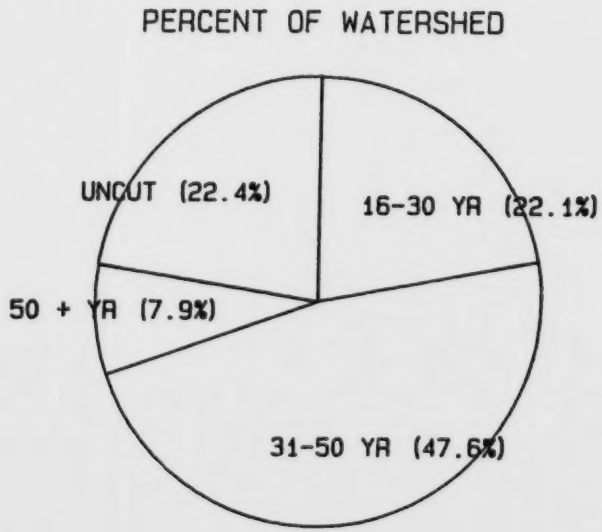
NO LOGGING HISTORY

6. All of watershed is unlogged. Lower 10% is within Pacific Rim Park, upper 10% is within P.S.Y.U. River below Cheewhat Lake, borders swamps and small ponds and has a very shallow gradient. There is a small run of creek sockeye. Lake fertilization are proceeding in this system.

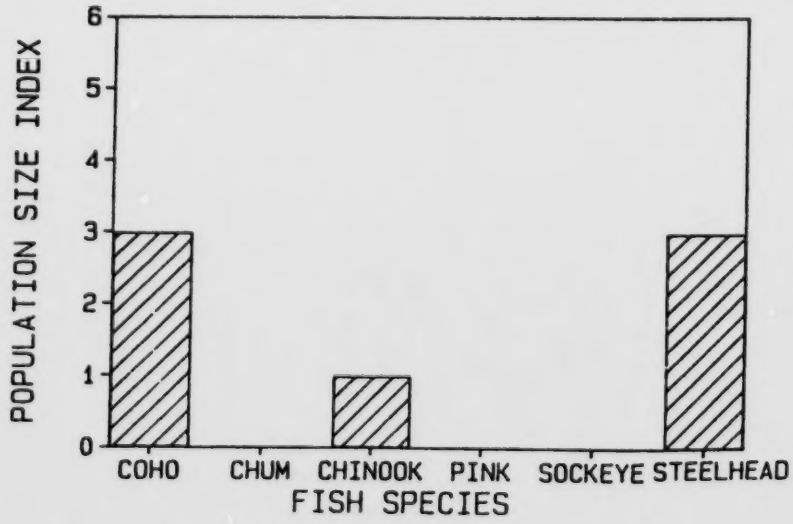


Child Creek

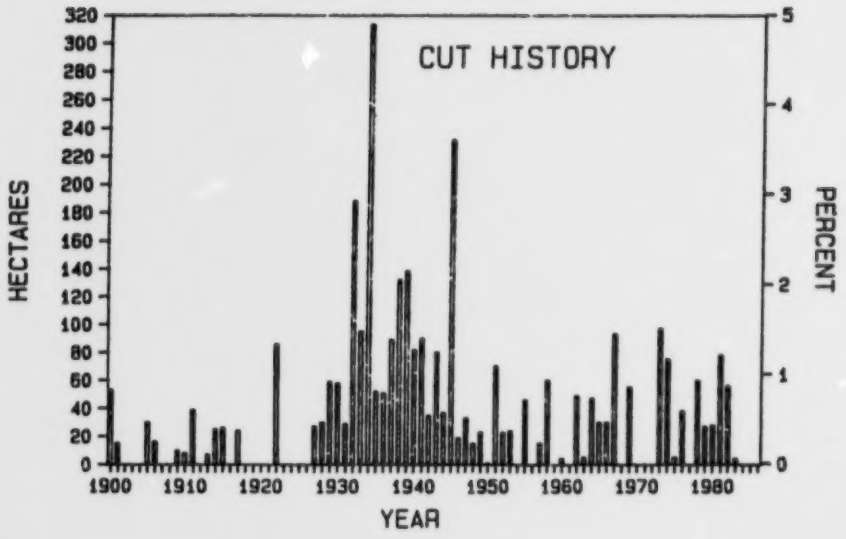


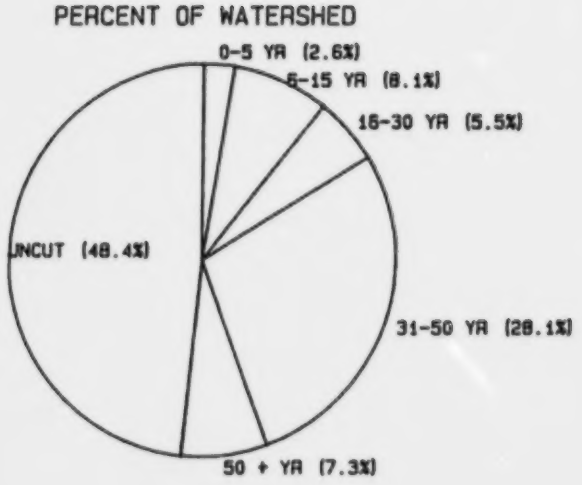


7. Two third order branches enter mouth of creek which then enters China Creek just above the park. Approximately 77% of watershed has been logged and all activity ceased in 1955. Thus, watershed is almost entirely covered by established second growth. Logging railways were used in some areas.

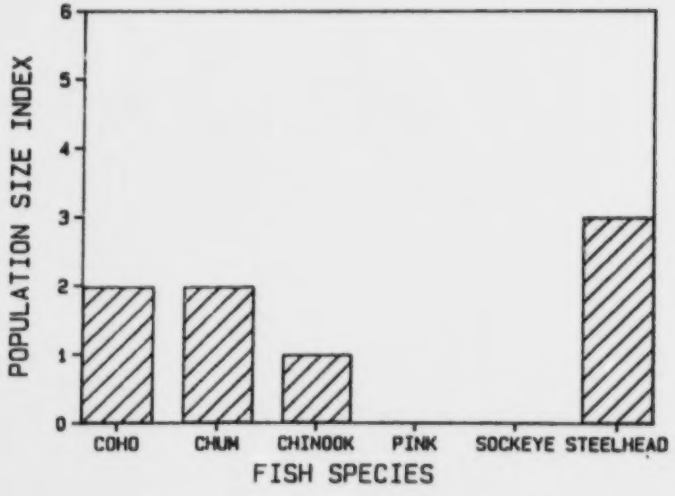


China Creek

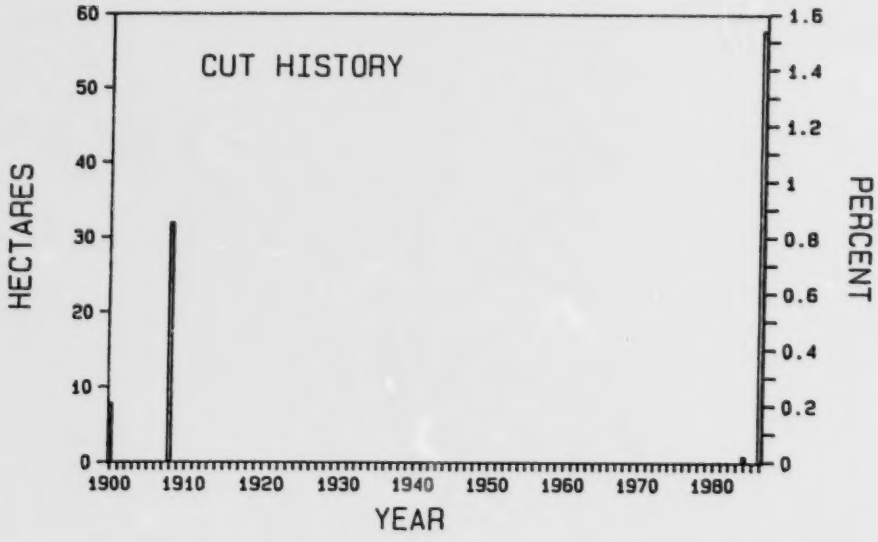


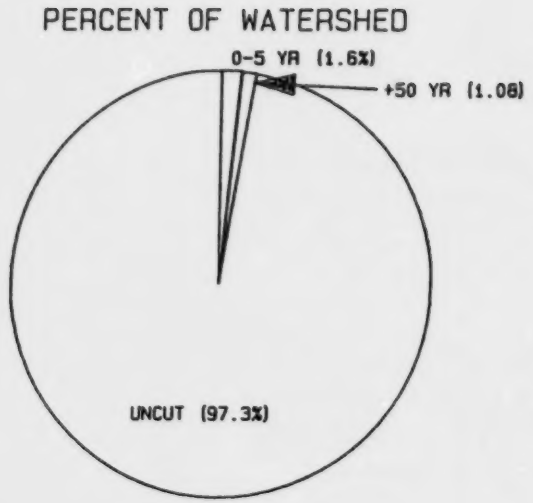


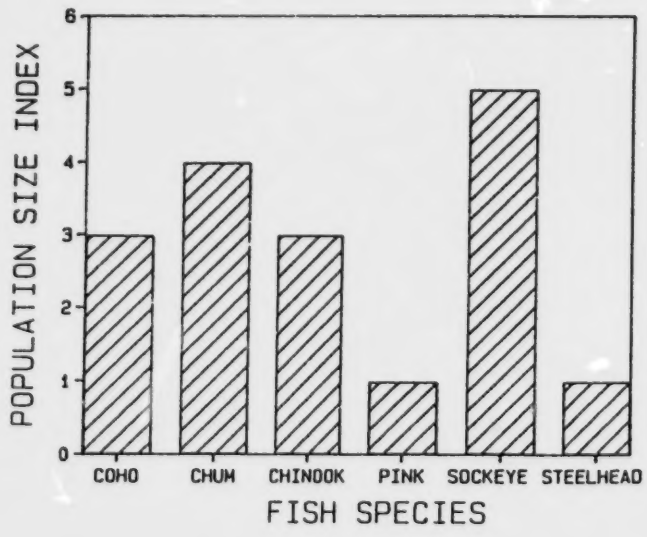
8. Mouth of creek and estuary is located within China Creek Park. Much of the logging was done by early logging railway. Logging has taken place from 1878 to 1984 and most available timber has been removed. Large face openings along creek were made in early 1930's. May be useful in examination of early logging effects and potential effects of second growth harvest.



Clemens Creek



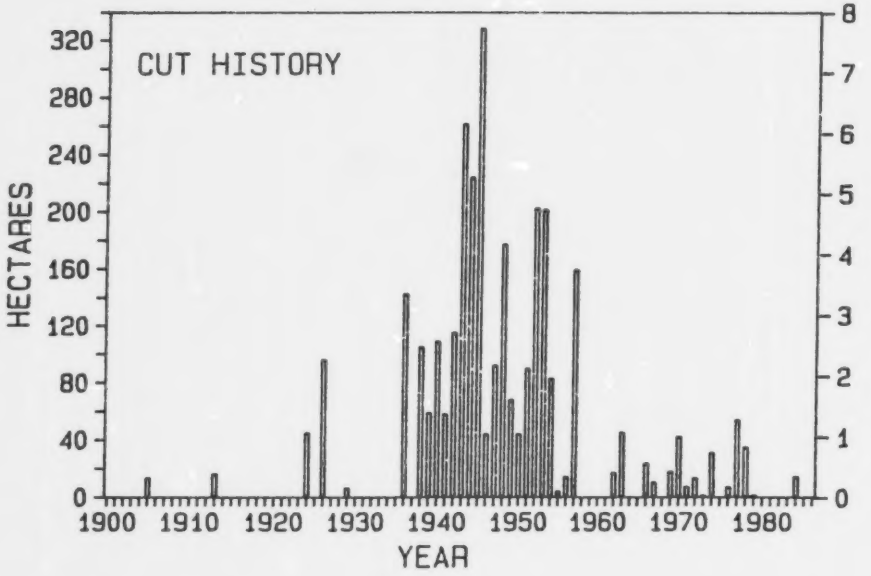


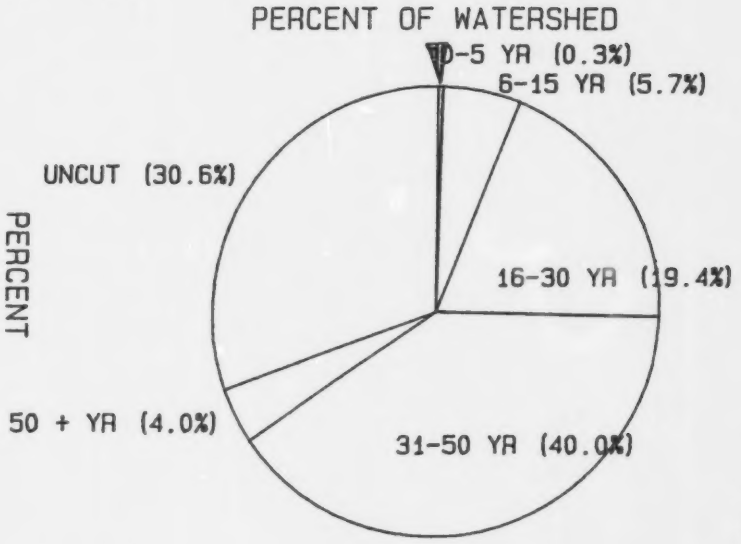


9. Old openings along lower river (1897-1904) possible selective logging and use of creek to transport logs. Remainder of watershed unlogged until 1984 with projected commencement of active logging and road building. Henderson Lake has been fertilized by Fisheries Enhancement Project, since 1976. Access is by boat or plane only.

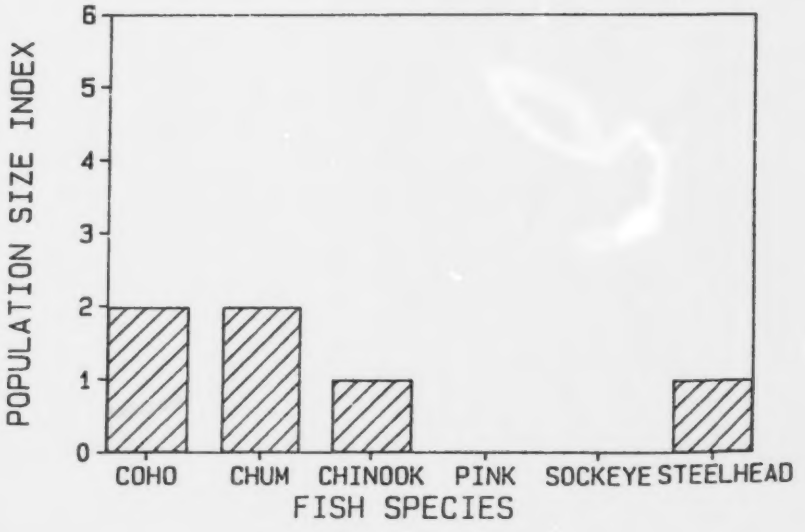
Upper tributaries have been impacted by numerous rock slides and possible debris torrents (natural) and these may be of interest to study. Small lake (0.5 ha) may be of interest as its perimeter is projected to be logged in 1991.

Coleman Creek

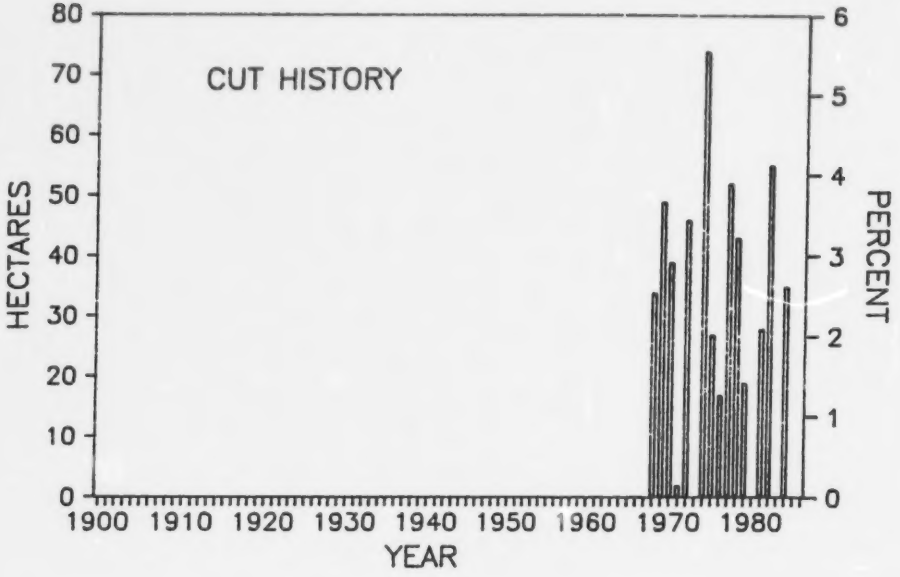


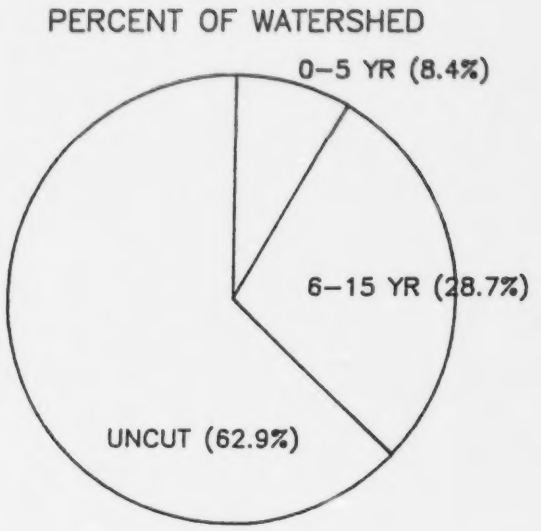


10. Franklin Camp, represents a major development on this watershed. Excellent access as road parallels the river for its entire length. Major openings along creek 1940-48. Much of watershed logged by railway. One large opening (1.0 km of river) was cut in 1926 and should be examined, another in 1913 may border creek for 200 m. Some log dumping in estuary.

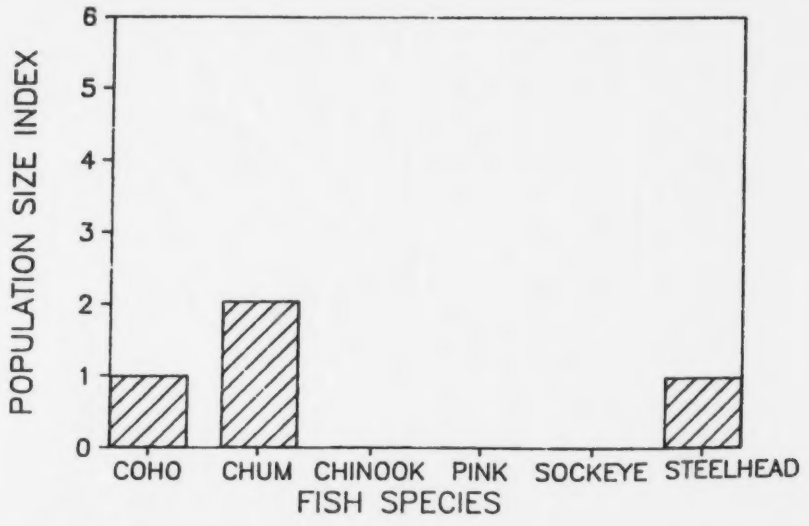


Consinka Creek

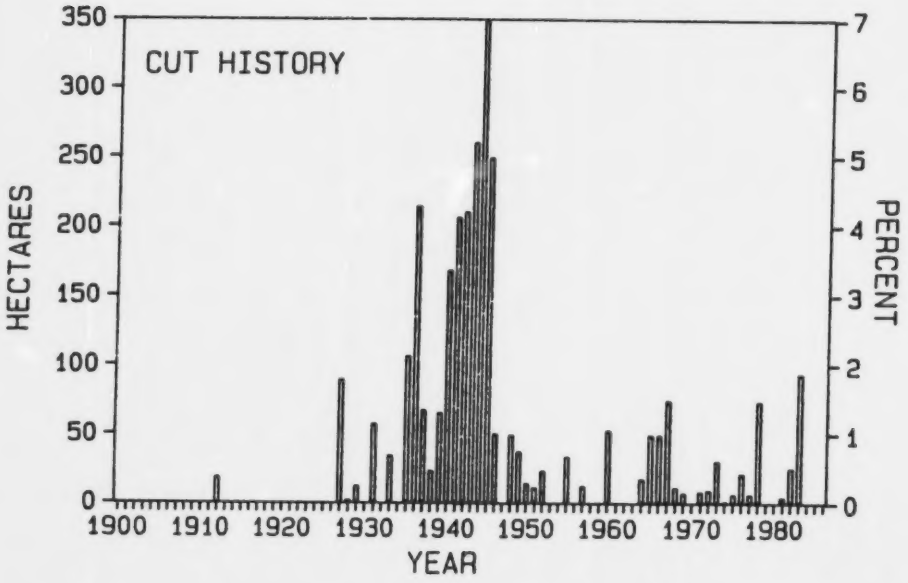


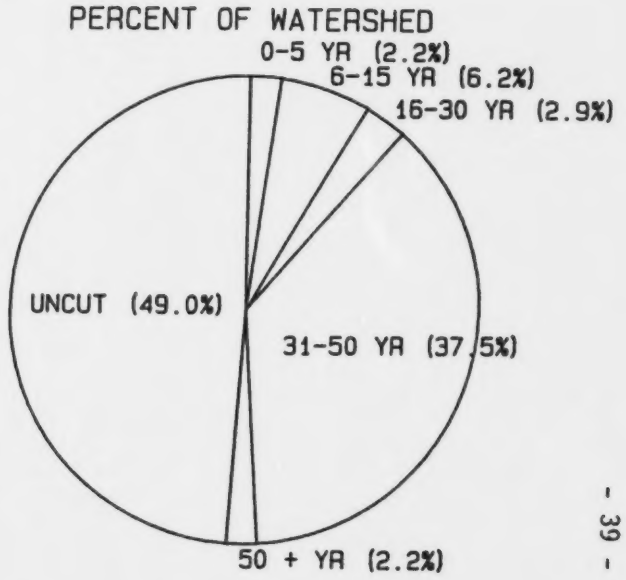


11. Very limited accessible length (0.1 km). Study potential is very poor. Three small lakes (total of 56 ha) are located above the inaccessible falls.

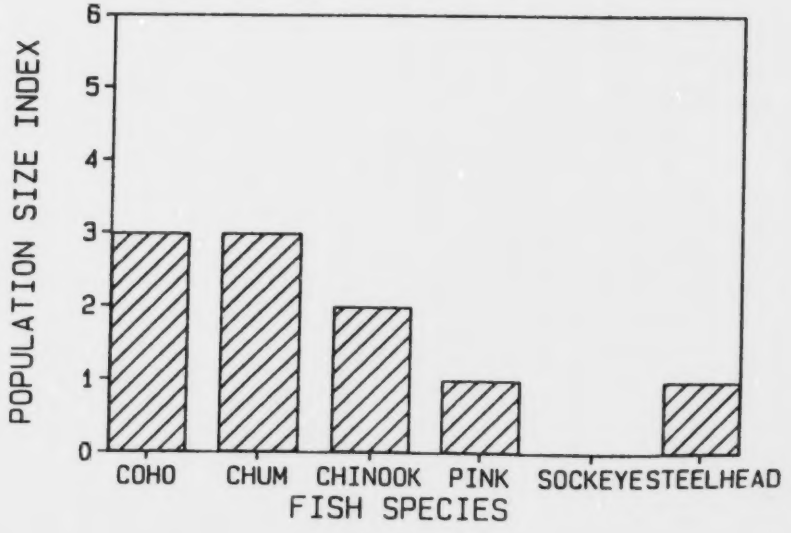


Corrigan Creek

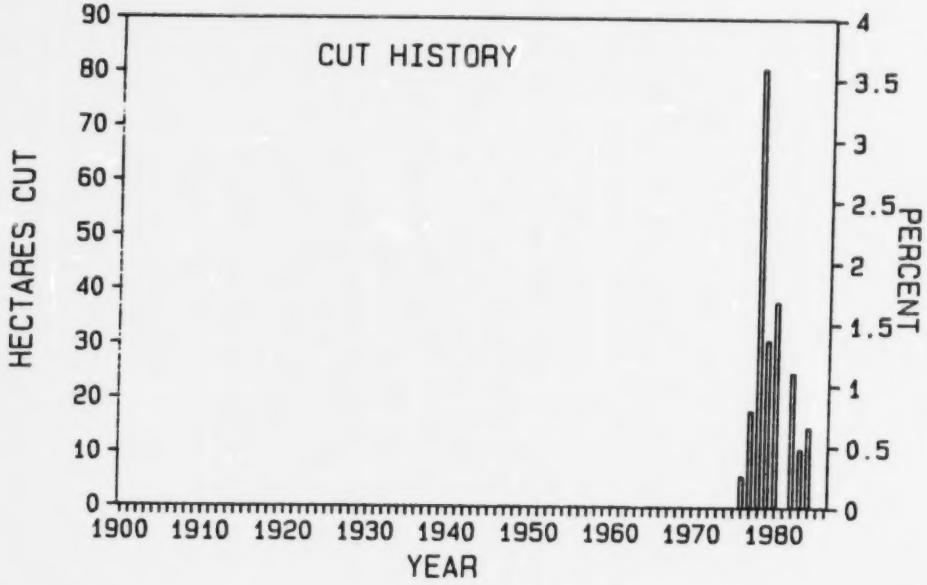


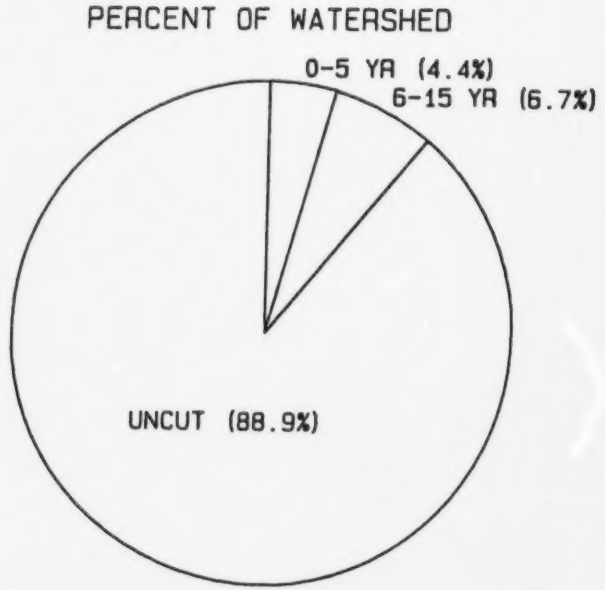


12. An impassable falls at 0.5 km on Corrigan Creek prevents access to upper areas. Logging has been extensive since 1927, with good second growth now present throughout. Approximately 0.5 km^2 of mineral leases in upper section. Much of the system was logged by railway.

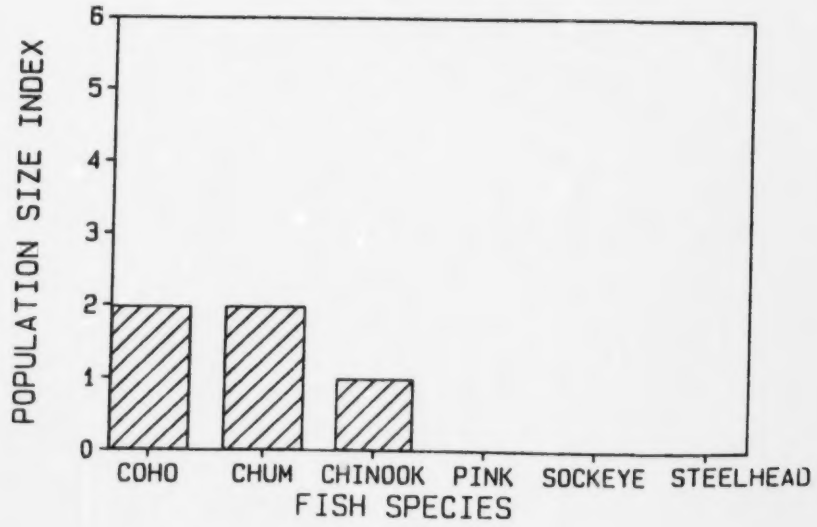


Cour D'Alene Creek

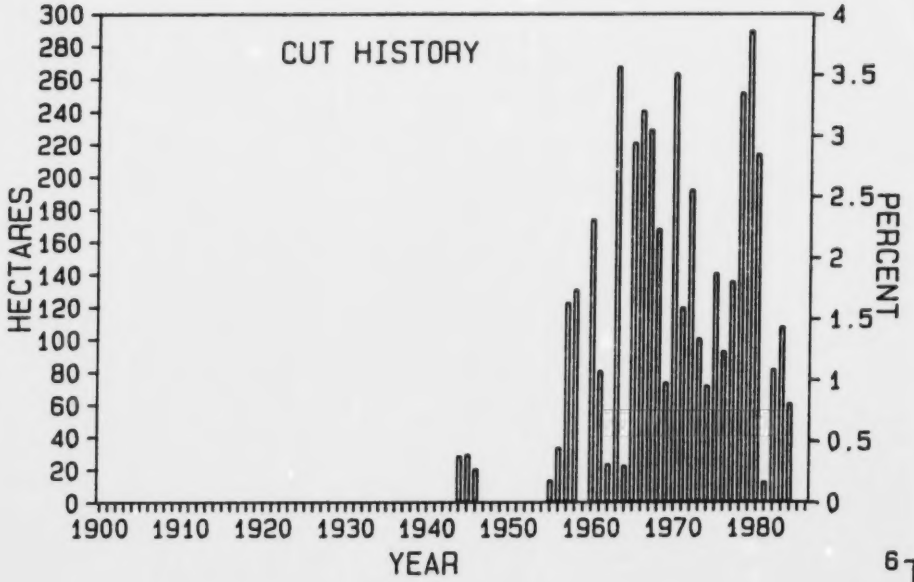


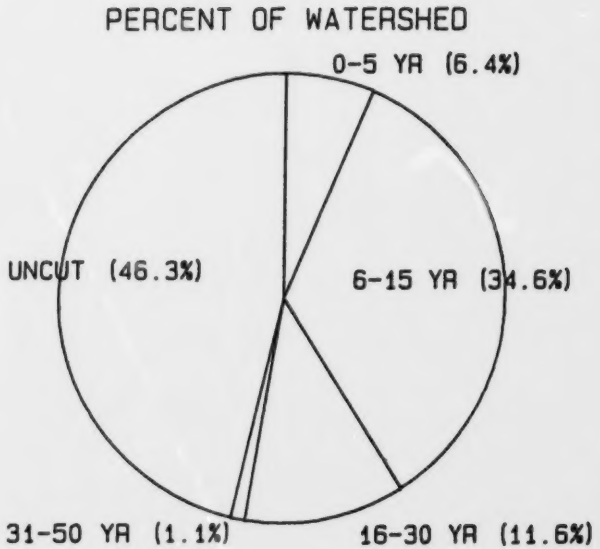


13. Much of watershed unlogged. In lower section harvest is recent 1979-84 with a small section of old growth remaining. Many of the upper areas are non-commercial cover and are steep. Access is by boat only.

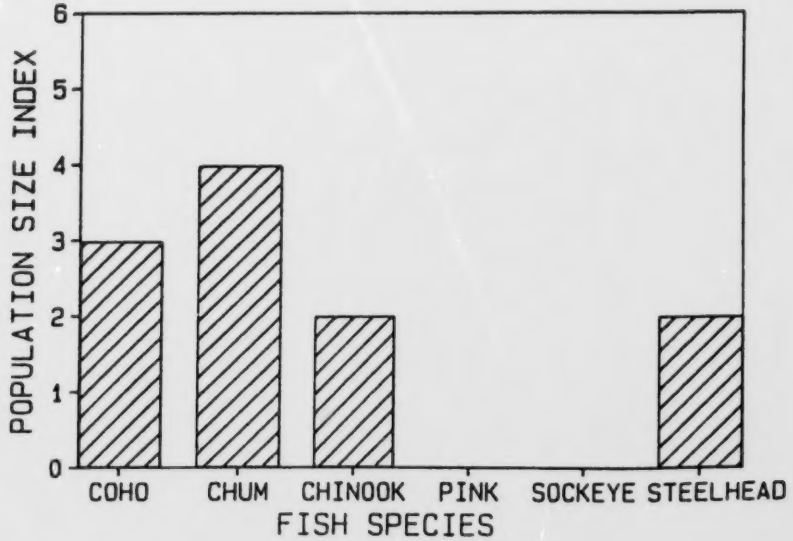


Cous Creek

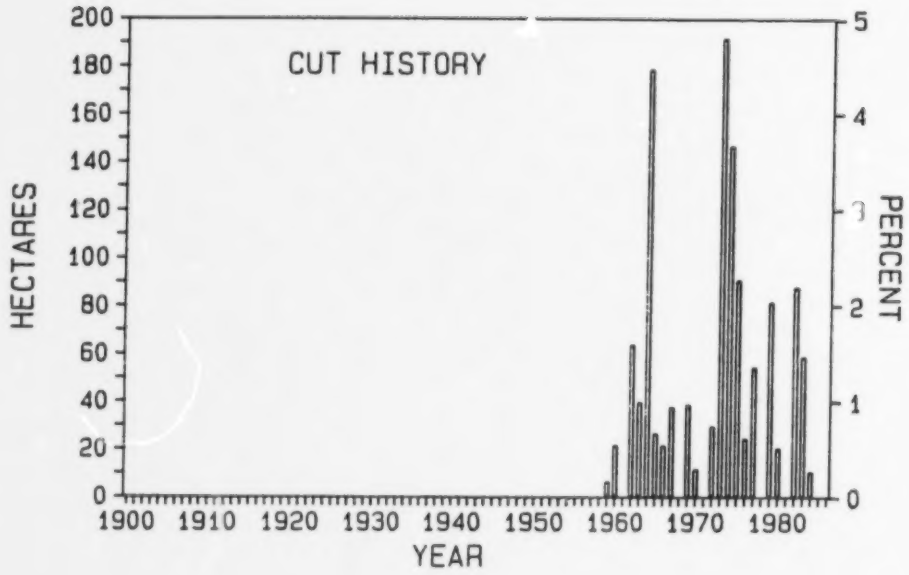


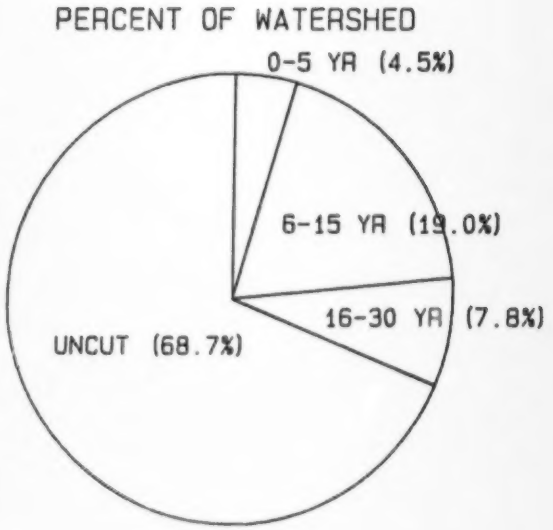


14. This system has a run of summer steelhead and estimates of coho may be highly underestimated. Lots of small swamps, debris jams and deep ponds. Harvest was constant and steady from 1957 to 1980. Some old growth along stream in lower section only. A number of small streams enter the estuary of Cous Creek.

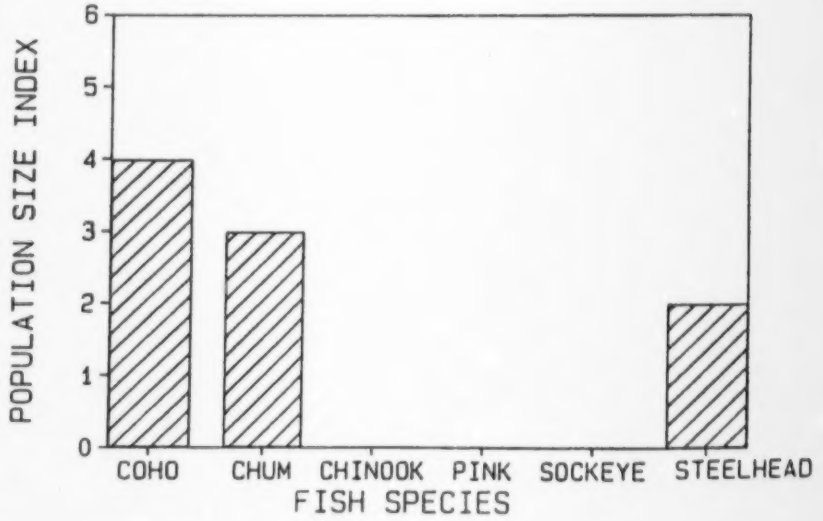


Draw Creek





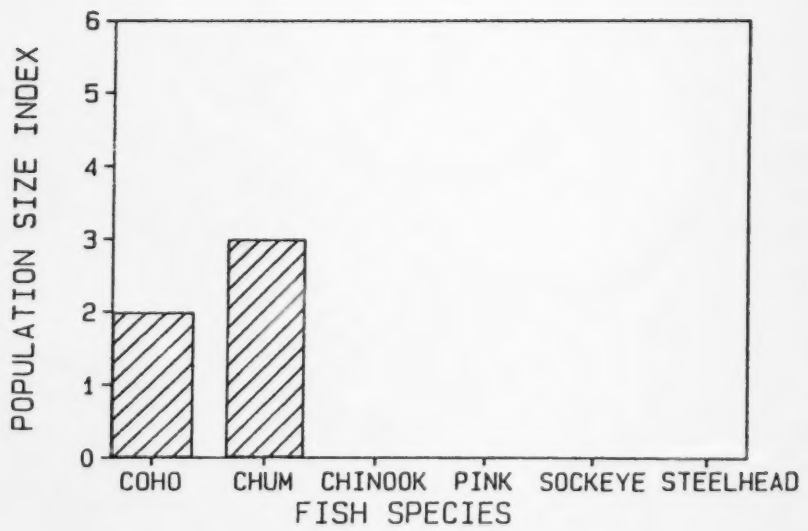
15. Stream enters Maggie Lake. Approximately 30% of watershed is TSA, the remainder is within TFL 44. Watershed has had considerable non-forestry activity including mining (Noranda Mining Co. 1961-69) and B.C.H. easement. Sockeye eggs were planted 1929-41, but there were no appreciable returns. There is a fishway at 0.8 km.



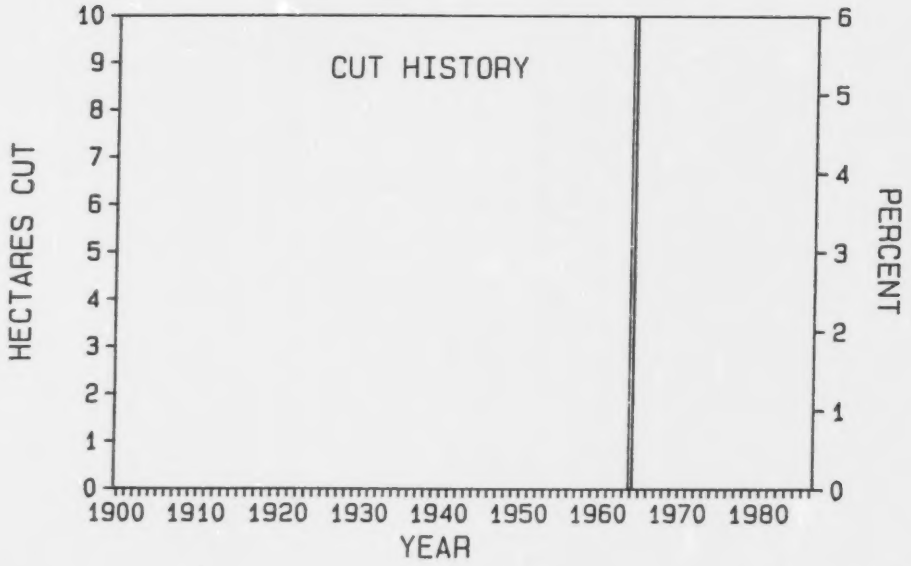
Dutch Harbour Creek East

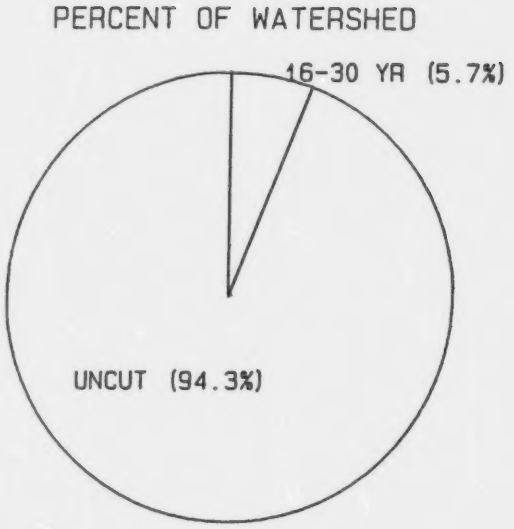
NO LOGGING HISTORY

16. Watershed is unlogged. Impassable falls at 3.2 km. Spawnable length and anadromous species spawning within this system is similar to that of Carnation Creek.

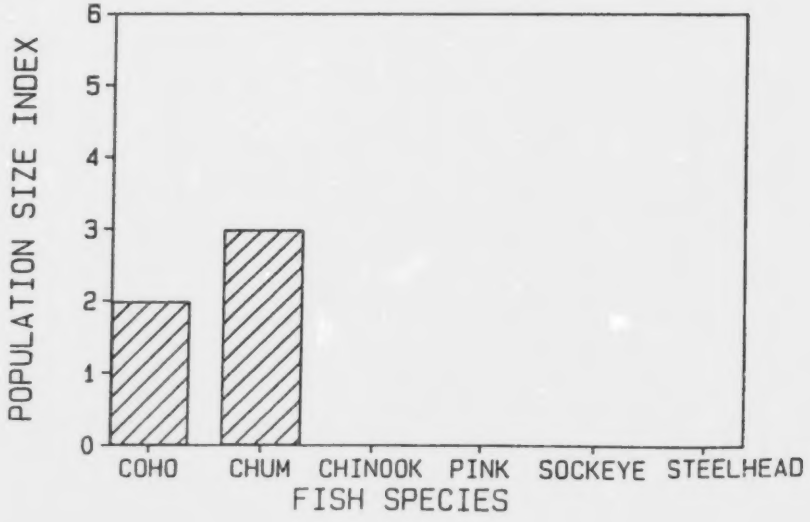


Dutch Harbour Cr. West

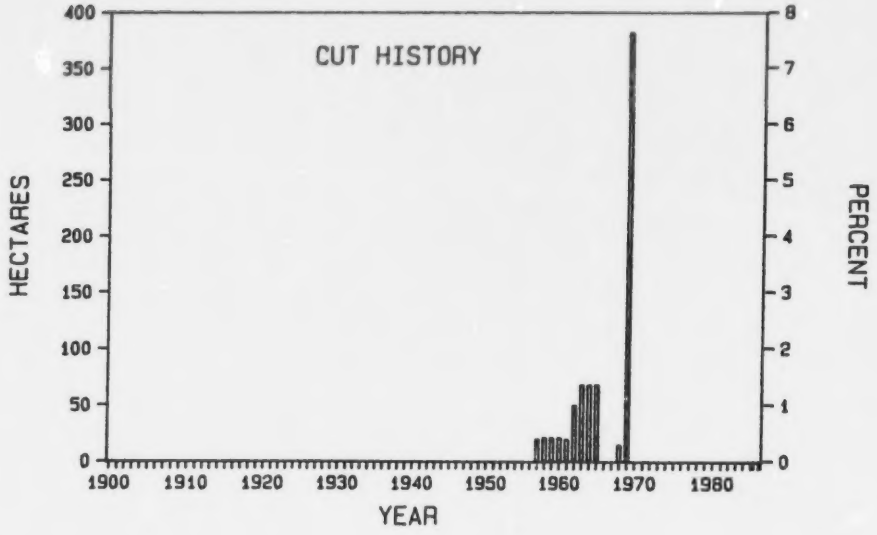


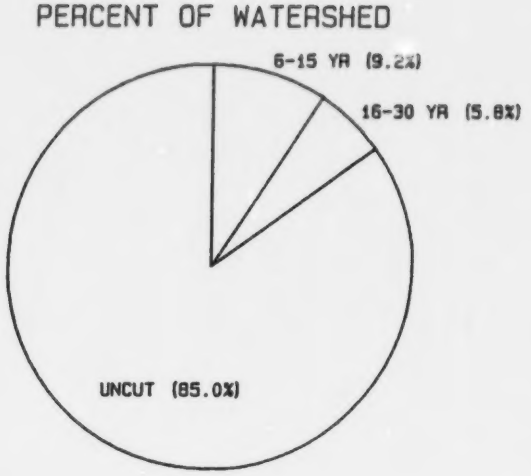


17. Only a very small uppermost section of the watershed has been logged (less than 10 ha). Access is by boat only. Stream enters into a narrow inlet approximately 0.2 km long.

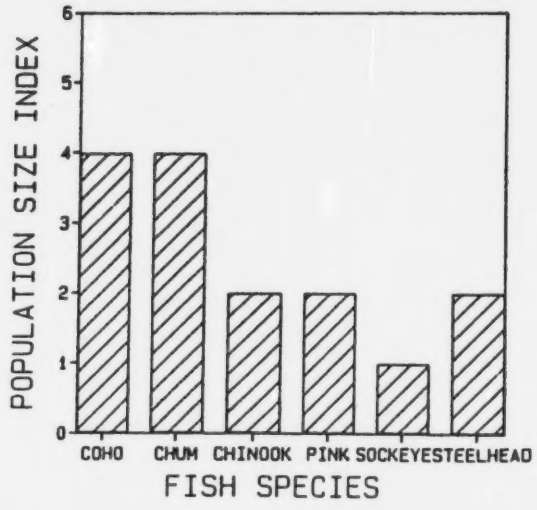


Effingham River

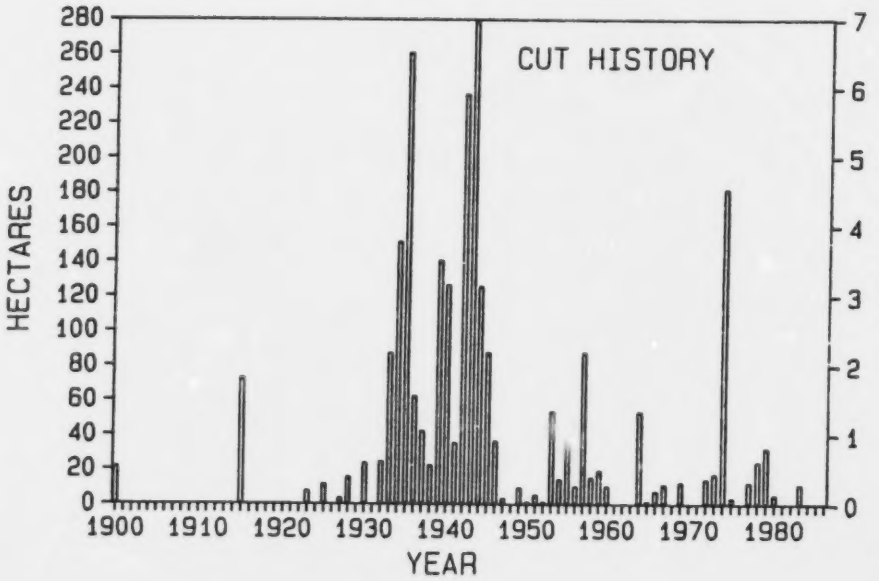


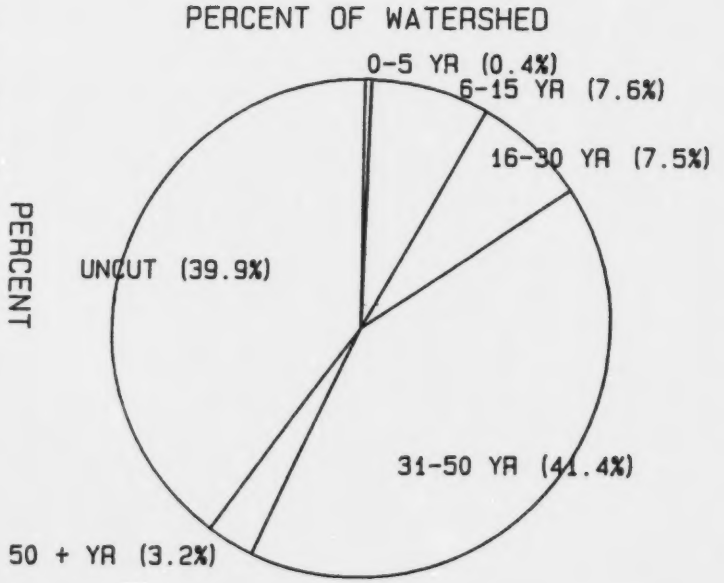


18. Estuary may be of interest as it appears to be very swampy. Most of the harvesting was near the river and occurred 1957-69. River has supported all five species of salmon as well as trout. Poor access to watershed (requires boat) but an old road extends from mouth to top. Possible examination of harvesting effects on main-channel with logging commencing 10 years prior to Carnation Creek.

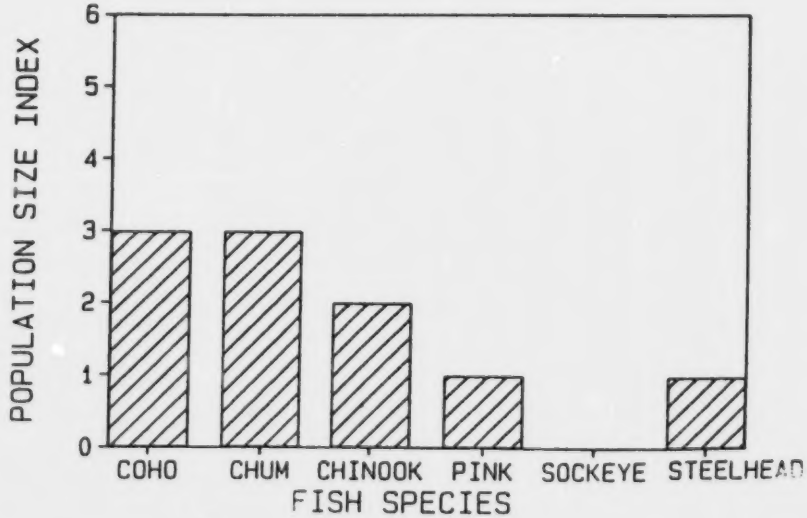


Franklin River

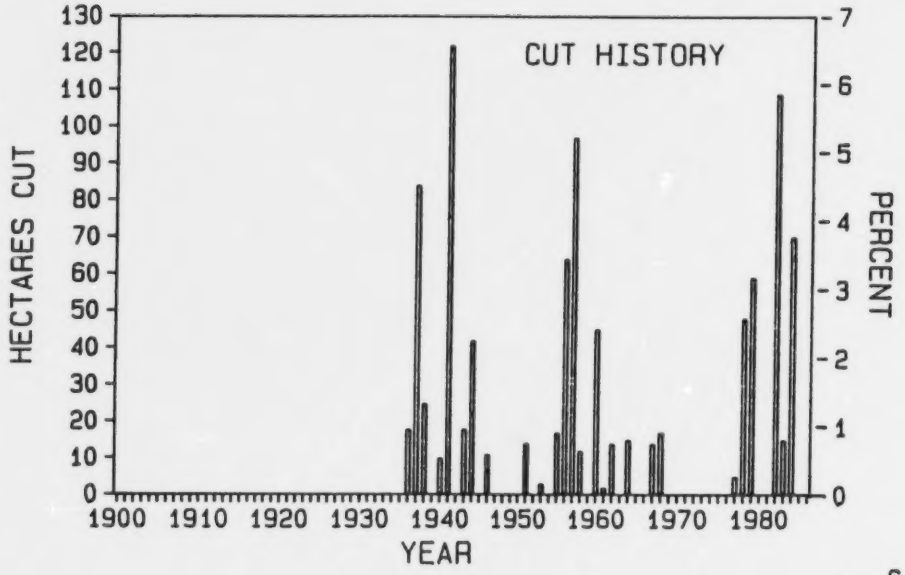


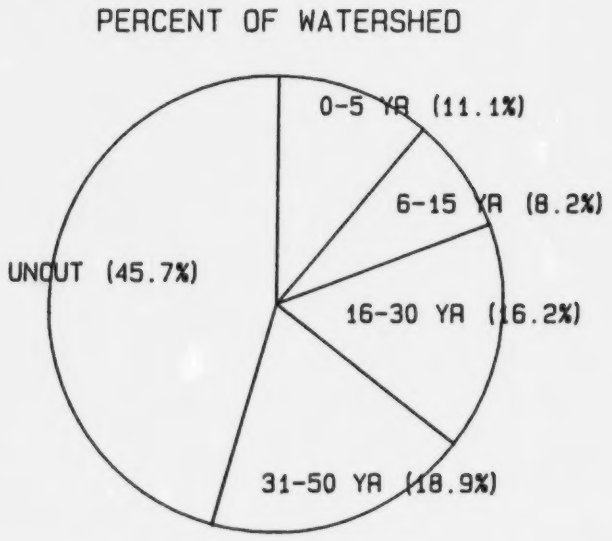


19. The earliest cuts are at the mouth of this river (1863-1918). Much of this watershed was logged by railway. Upper lakes at higher elevation is undisturbed M.O.F. park. Many major openings along river (1927-59). Logging camp originally placed at mouth of river.

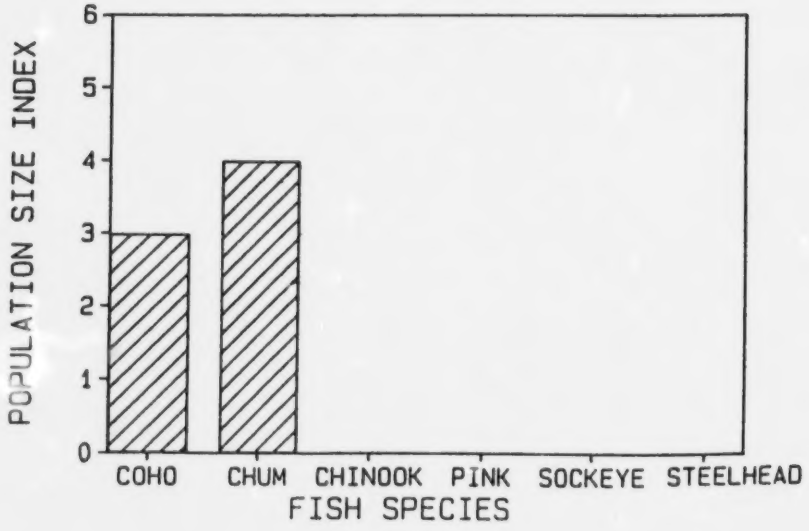


Frederick Creek

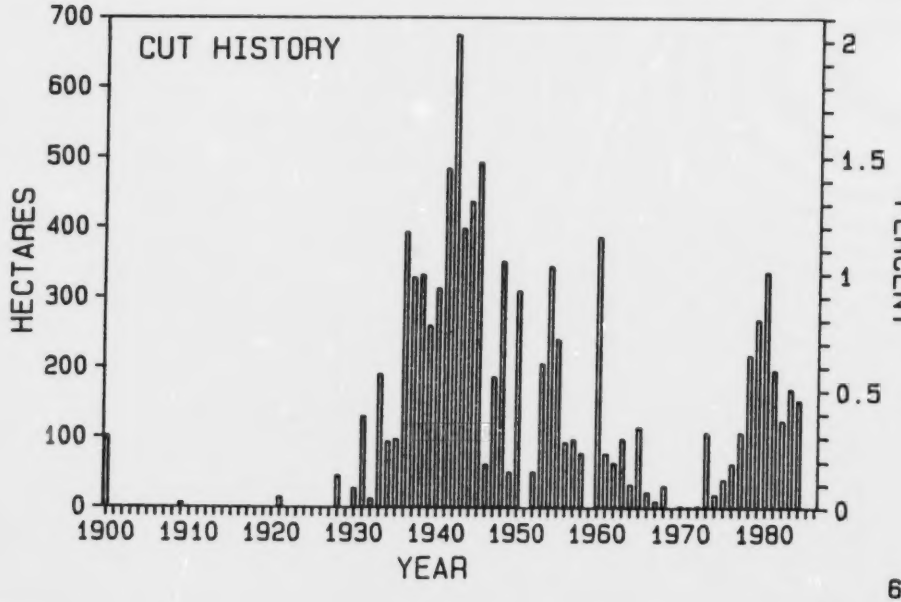


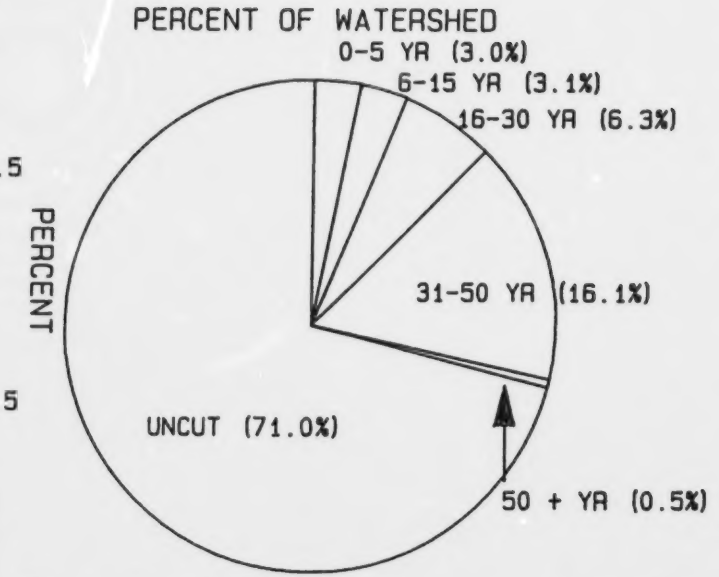


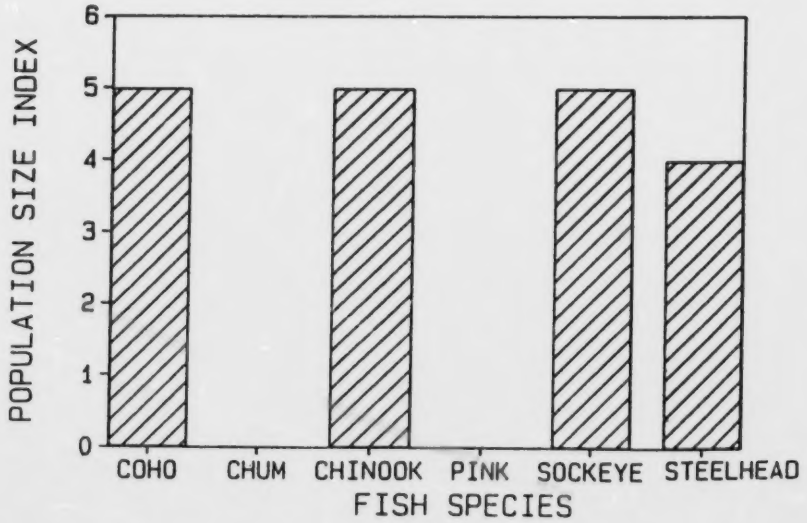
20. Numerous swamps and beaver ponds throughout. Pachena Lake (.38 km^2) is not accessible to anadromous fish. There is an Indian food fishery at mouth of creek and in Sarita River. Large creek openings 1938-41 have some potential study value.



Great Central Lake

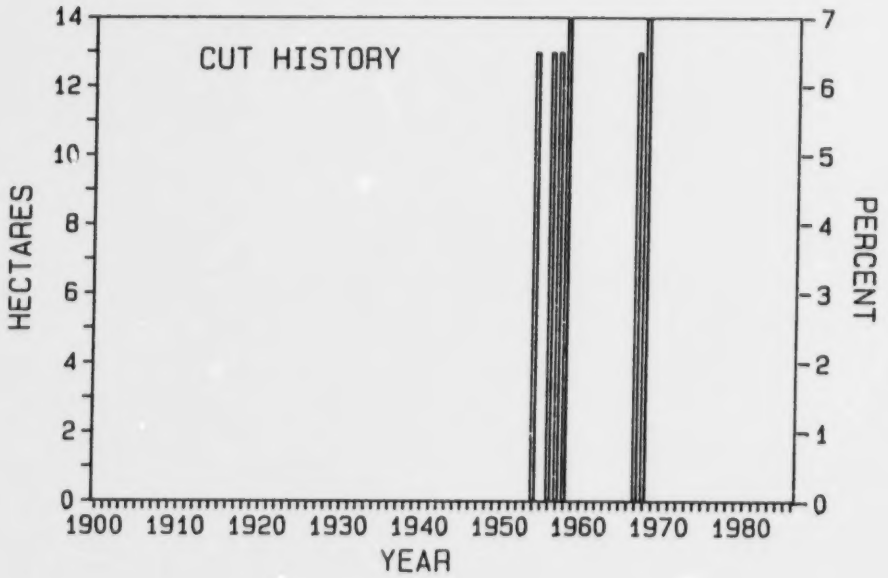


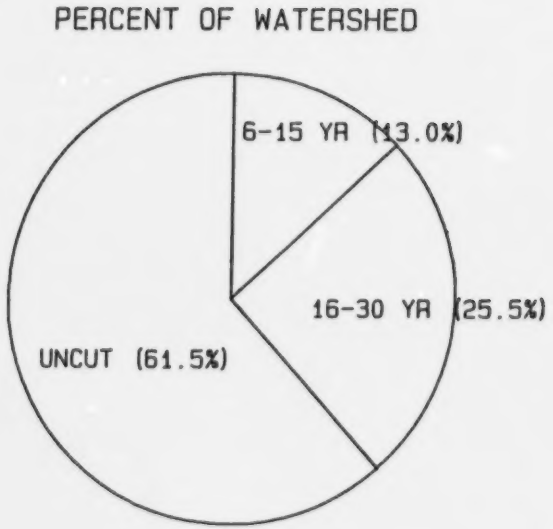




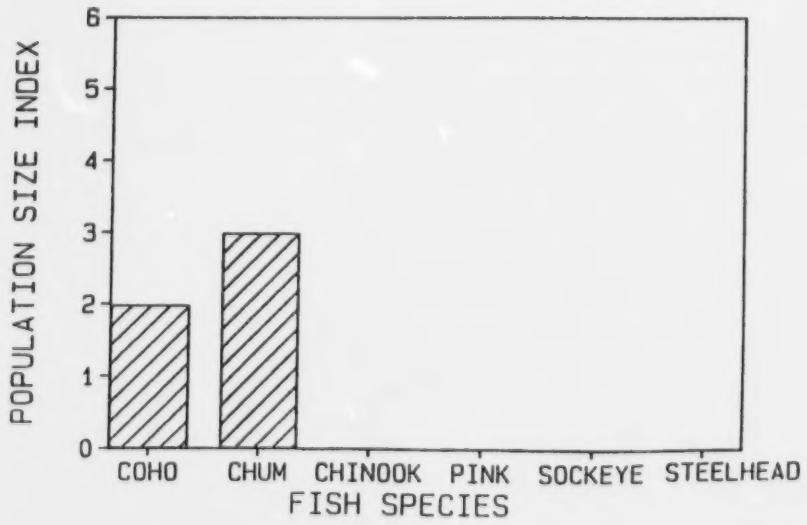
21. This section includes Great Central Lake and all tributaries above the lake. Lake fertilization project has used this lake since 1970's. Numerous tributaries may be used in paired experiments. Approximately 11% of watershed is in Strathcona Park. Major tributaries, McBride and Drinkwater creeks, flow into this lake. Railroad logging occurred in 1940's, logged sites cover 95% of Great Central Lake shore. Many spawnable tributaries are apparant . A lake fertilization project commenced here in the early 1970's and is still ongoing.

Holford Creek

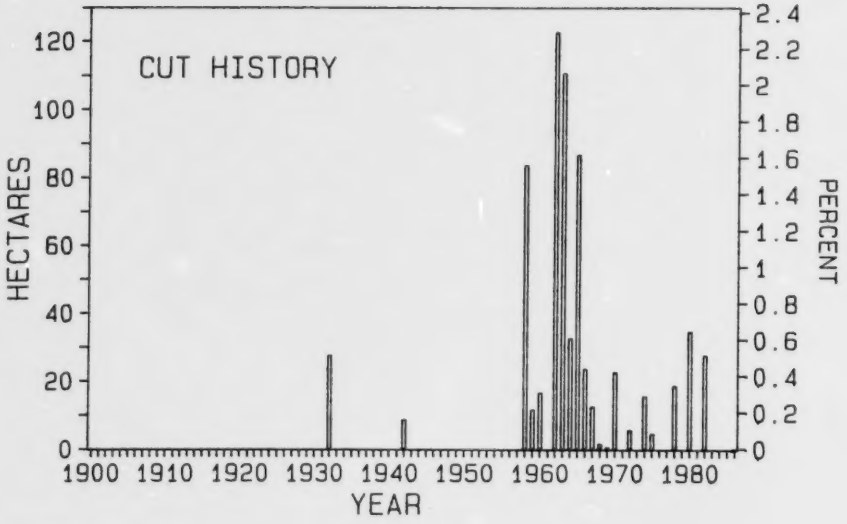


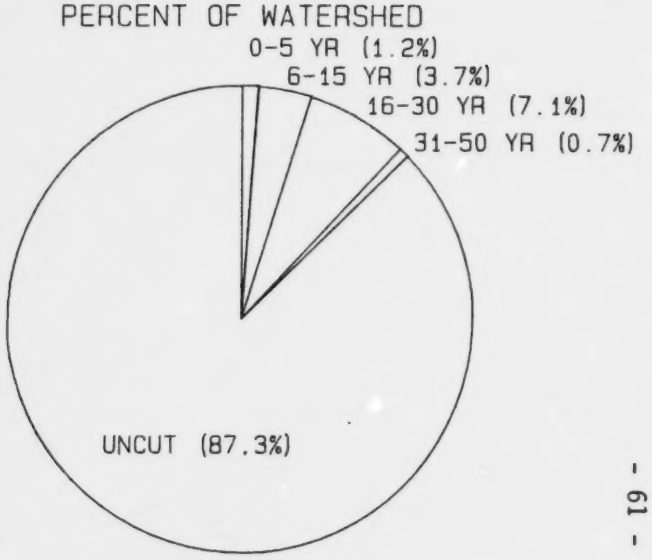


22. Holford Creek is situated on Tzartus Island and is isolated from all major river systems. At least 12 small streams (1°) also originate on Tzartus Island and these were not examined. Small degree of logging. An impassible falls exists at 0.2 km. Substrate consists of solid rock for at least 100 meters of the accessible length.

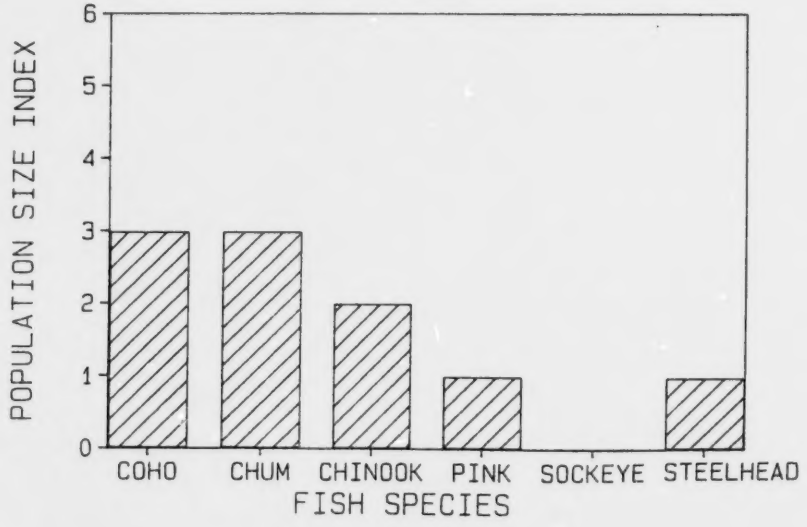


Klanawa R. (East Fork)

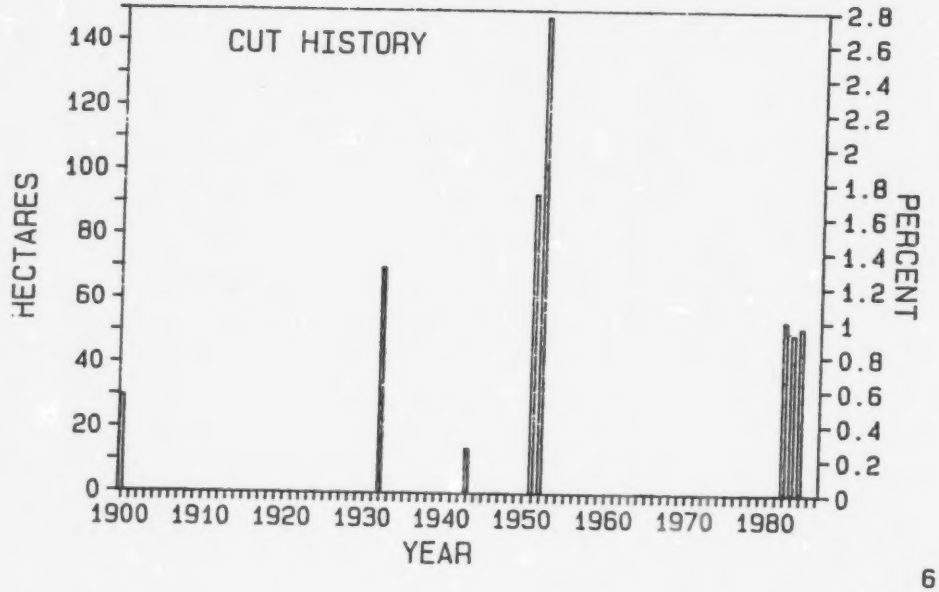


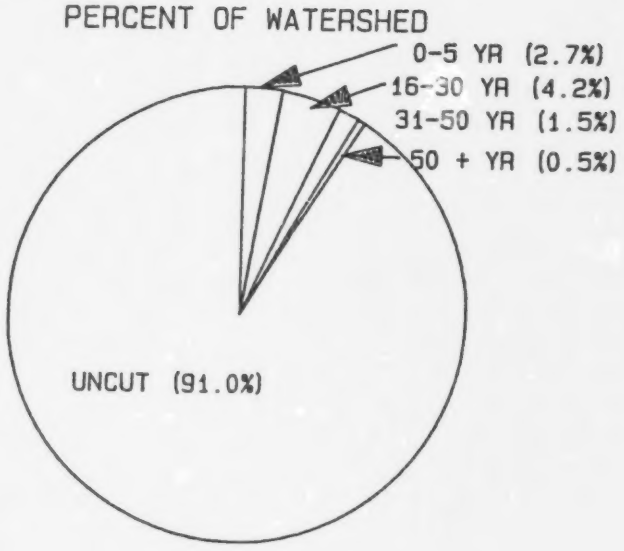


23. Approximately 3.5 km of river has been harvested with openings 1932, 42, 60-68, 78-82, and numerous unlogged sections. The watershed's east boundary is the Pacific Rim Park. Numerous third and fourth order streams enter the main channel within the spawnable length. Many tributaries totally within old-growth forests.

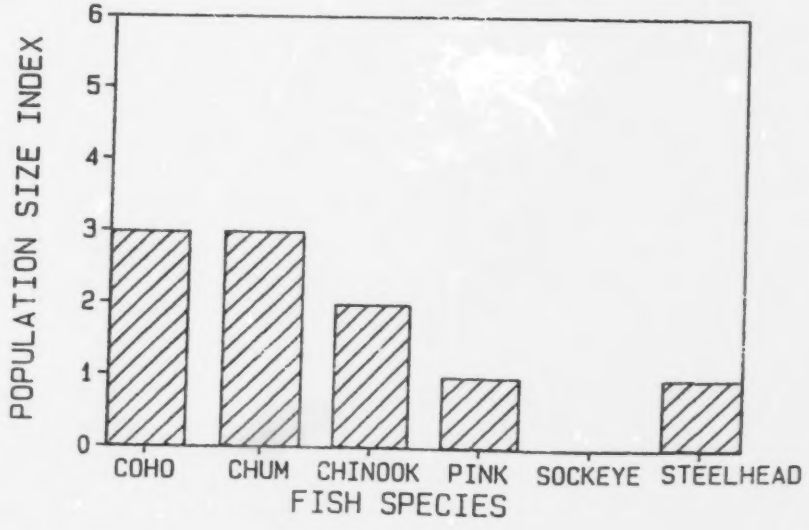


Klanawa R. (Lower)

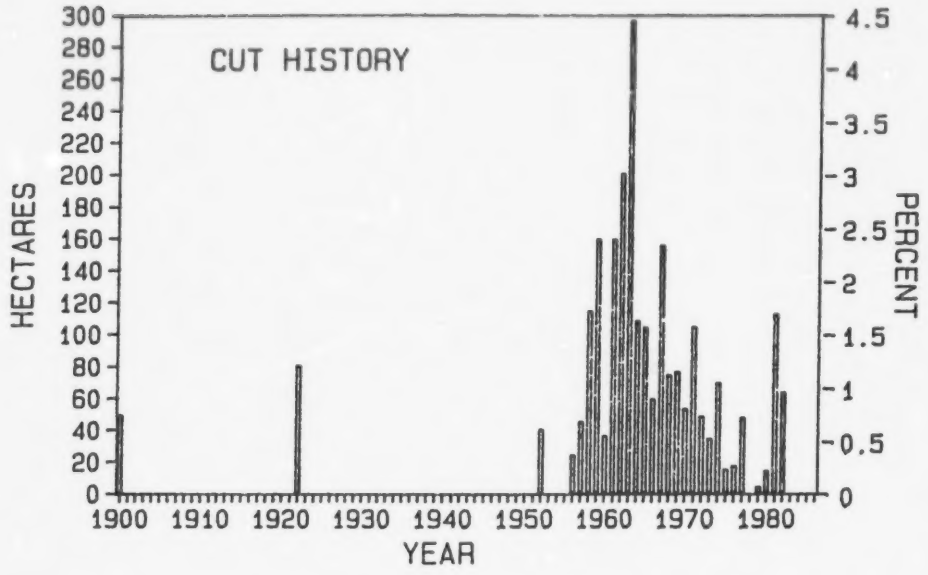


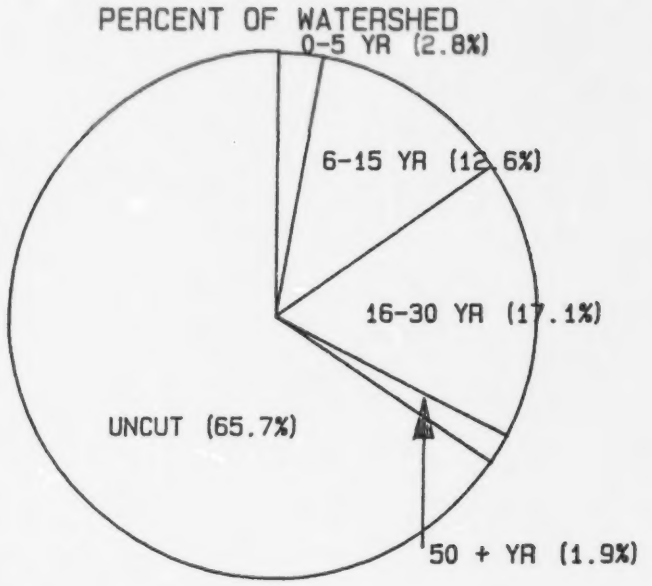


24. Lower 5 km^2 in Pacific Rim Park. Poor access throughout except for small area in north section. Large openings along river 1951-52. Three major forks (west/north/east) not included in this section. One major lake-fed tributary system (Blue Creek) is included. This area has more recent cuts and is actively being logged. Fish escapement records are very poor and numbers are possibly highly underestimated.

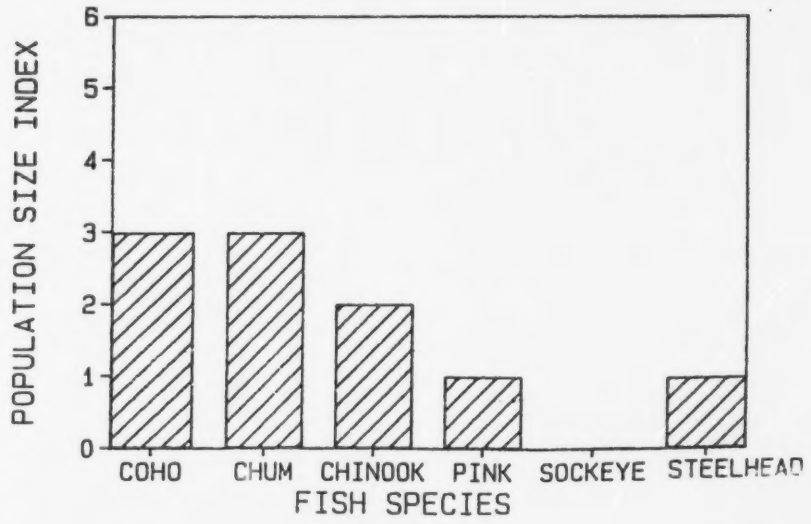


Klanawa R. (North Fork)

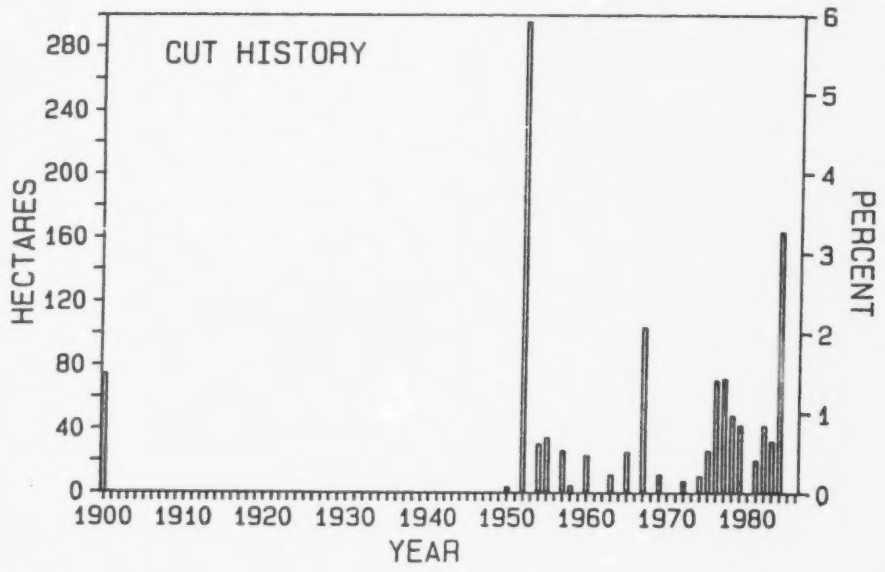


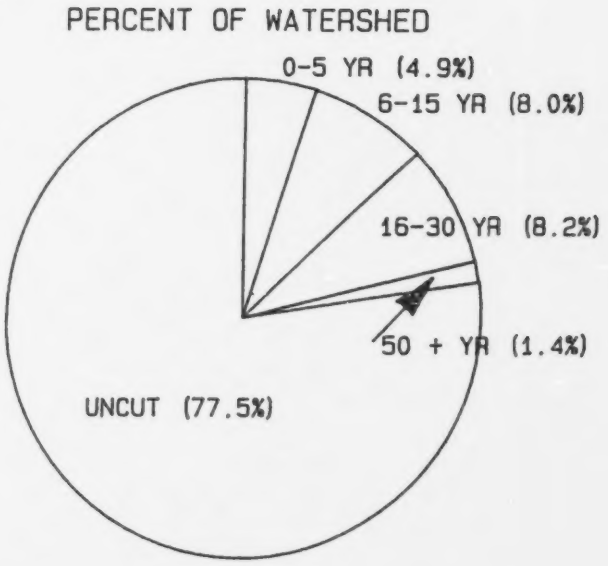


25. Poor access into lower and western sections of watershed. Lower sections harvested 1922 and earlier, while upper sections were harvested 1960 to 1980. Approximately 1 km of north fork logged in 1922 with 8 tributaries flowing through this section. A small 0.2 km section at mouth was harvested in 1897. Numerous swamps throughout.

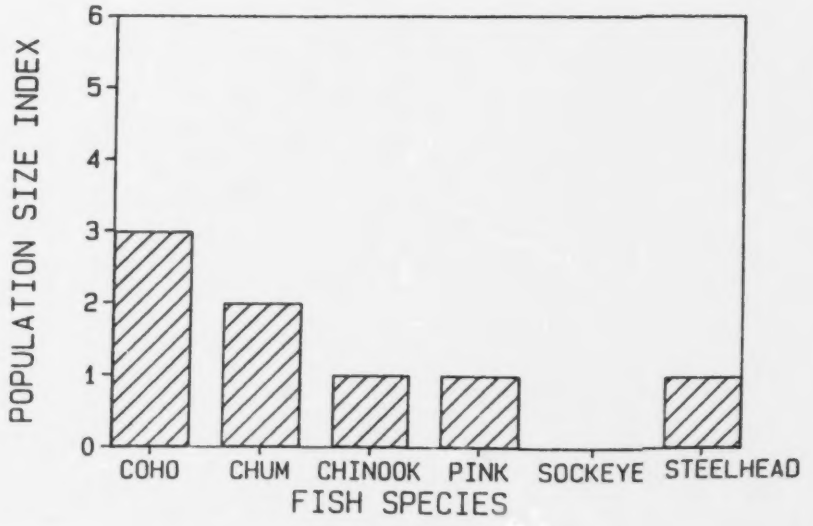


Klanawa R. (West Fork)





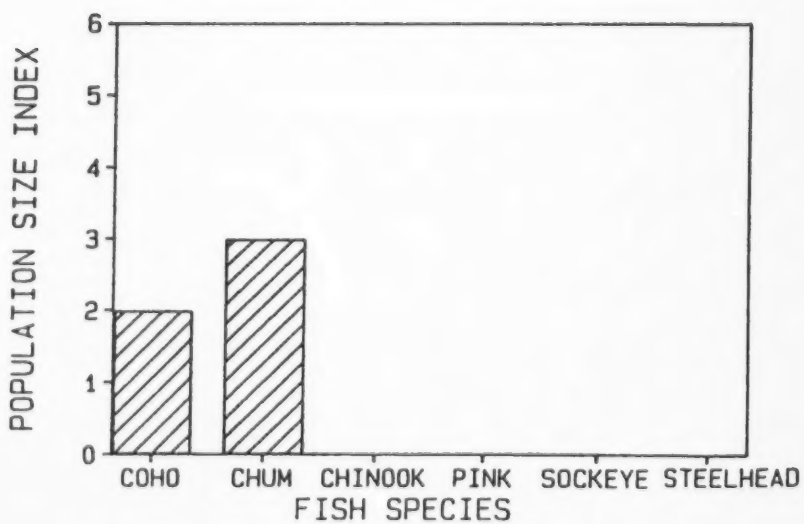
26. Both chinook and coho spawn in this fork. Numerous side channels and river islands in lower 7 km. Extensive logging along river edges in 1952, but no unlogged control is evident. Upper section of one spawnable tributary is largely unlogged. Numerous tributaries enter this river. Regrowth in lower sections of river is largely alder.



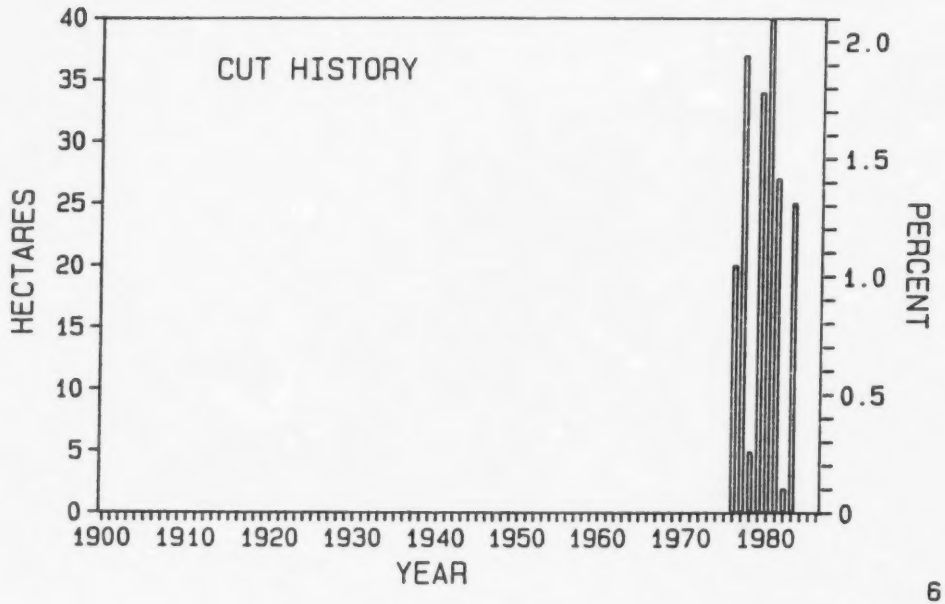
Little Maggie River

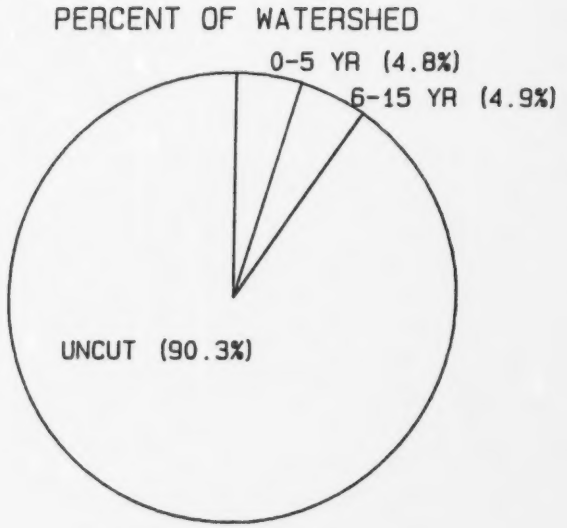
NO LOGGING HISTORY

27. Little Maggie River has many features similar to Two Rivers East and West but has an accessible length of only 0.4 km. Numerous small lakes and ponds in upper areas have great study potential but lack salmon. Small stream system to west also lacks salmon but also has similar features. Only the extreme lower section is accessible by road. Entire system unlogged as of 1984, but logging activity commenced in 1986-87.

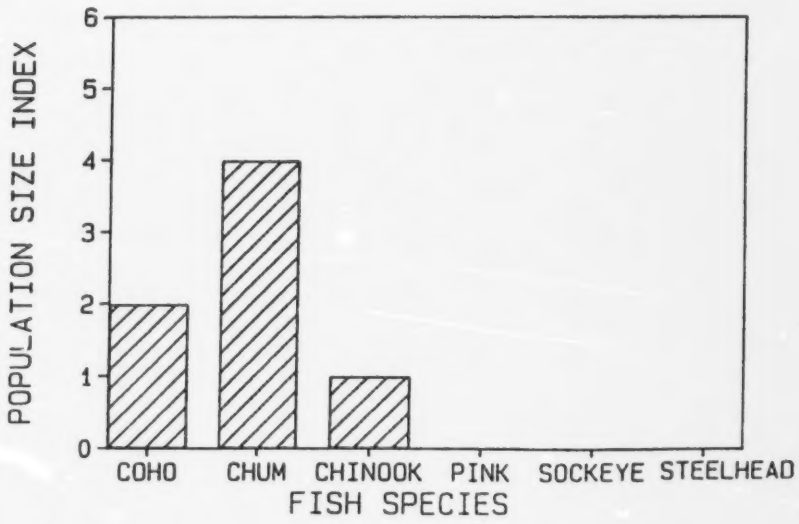


Little Toquart Creek

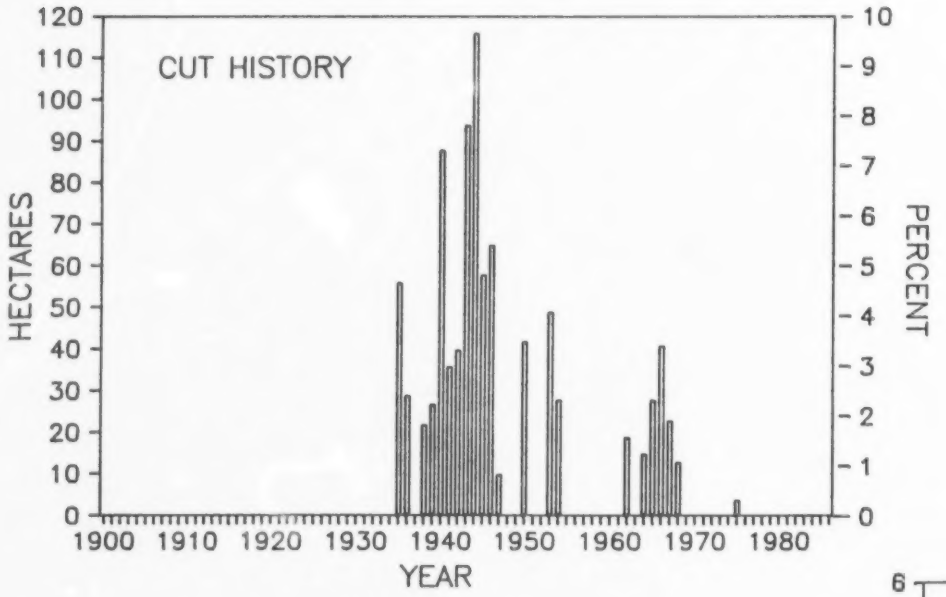


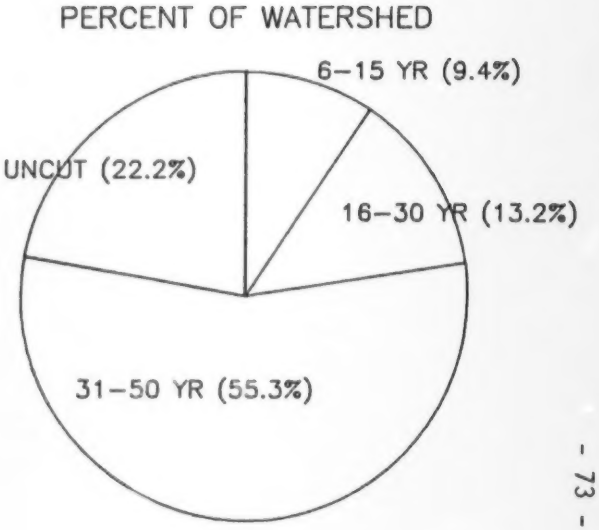


28. A falls just downstream from Little Toquart Lake is the upper limit of anadromous migration. Lake and associated swamps have good potential as rearing areas. There is poor access to all but the lower section of the watershed.

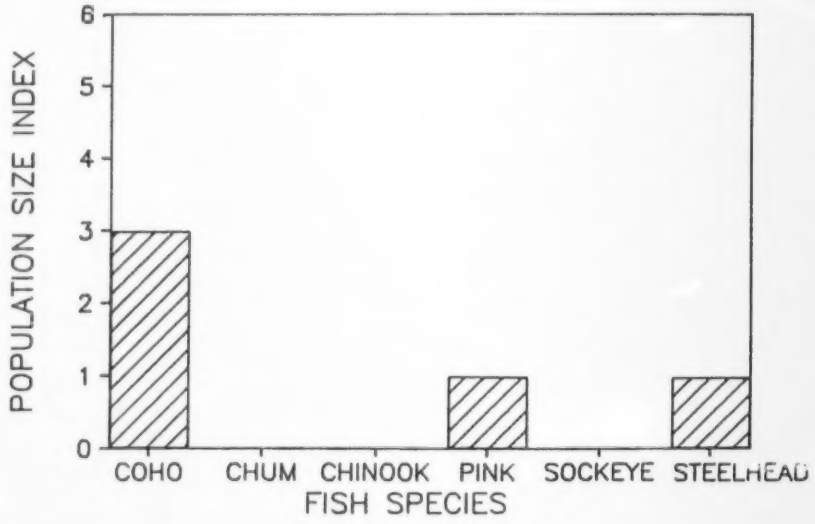


Lizzard Pond Creek

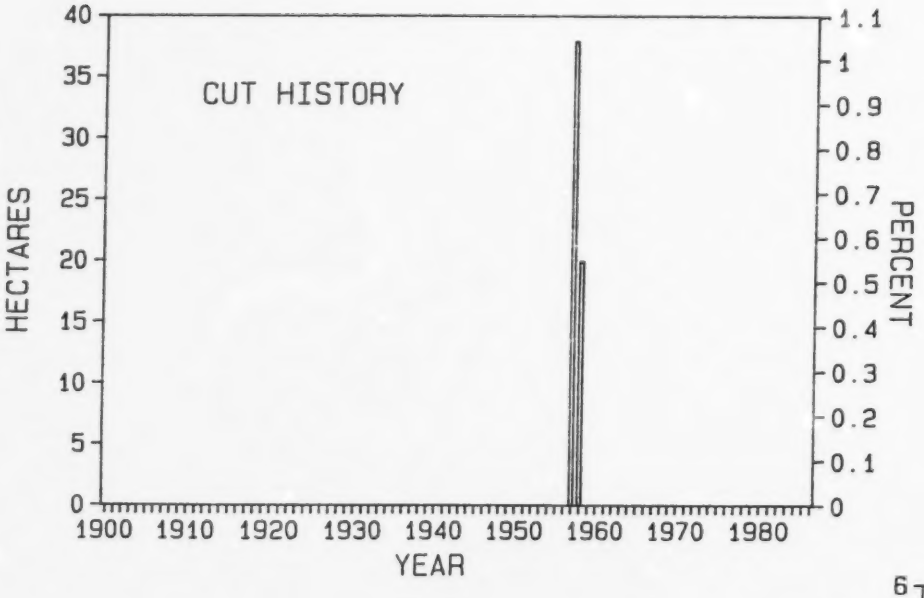


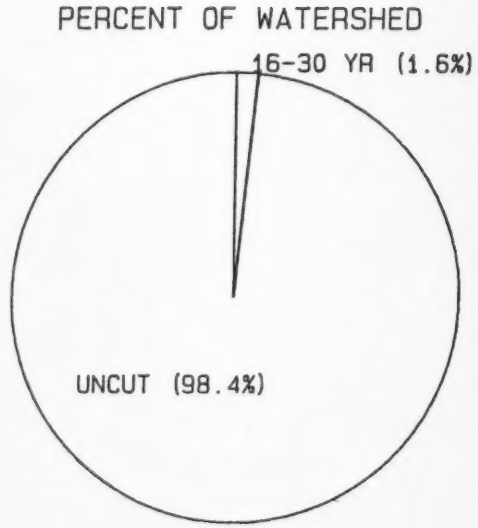


29. Information on spawning species is poor. There is a small dam on the system. Area around lakes has been totally harvested 1936-50. All sections along creek have been harvested (no old growth).

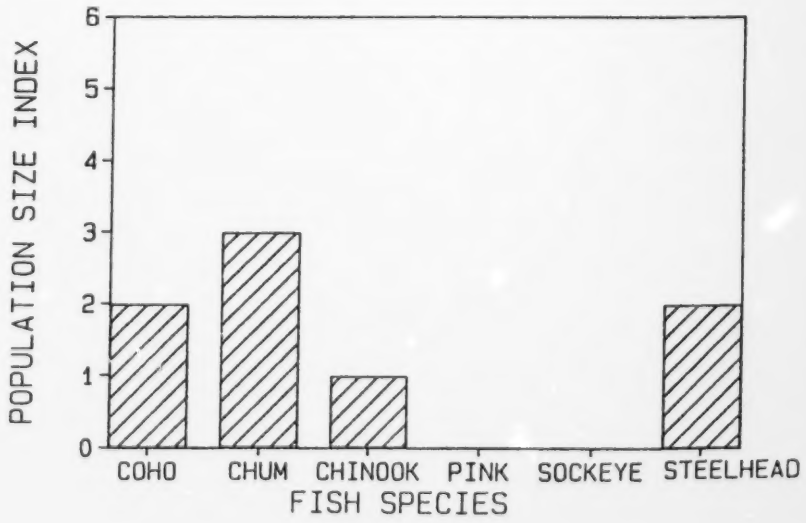


Lucky Creek

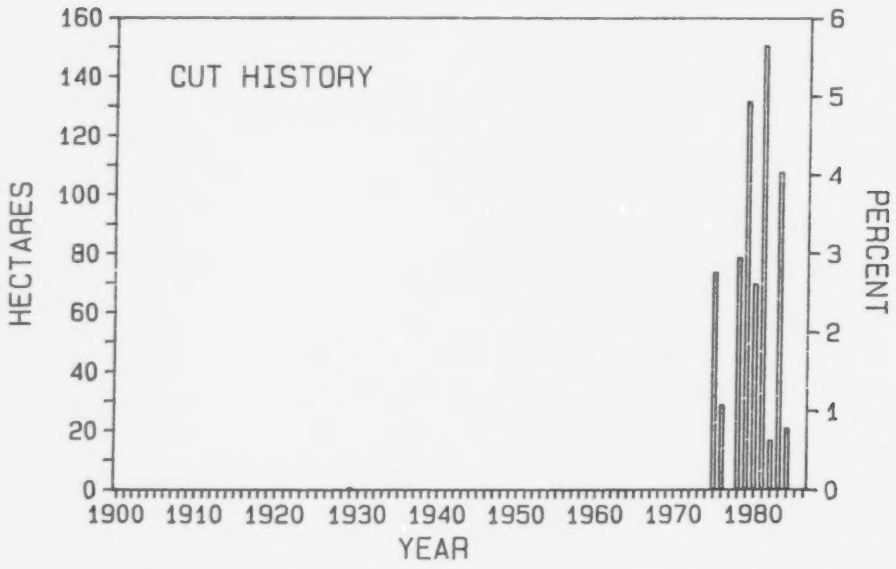


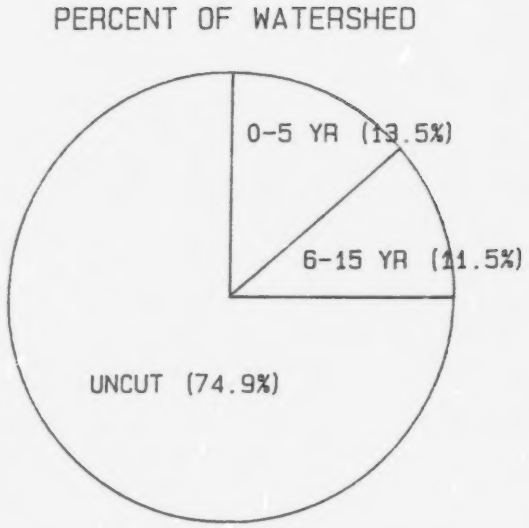


30. Above 0.8 km stream is a series of falls and canyons. Lower section and estuary, were harvested in 1957-58.

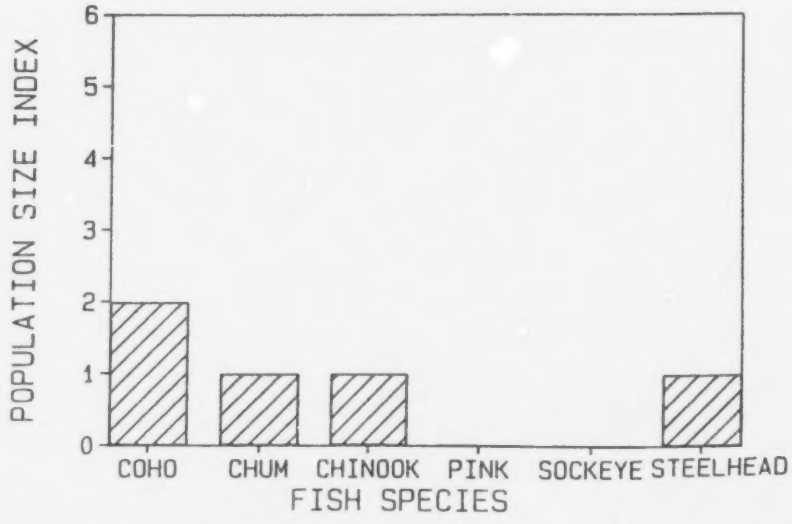


Macktush Creek

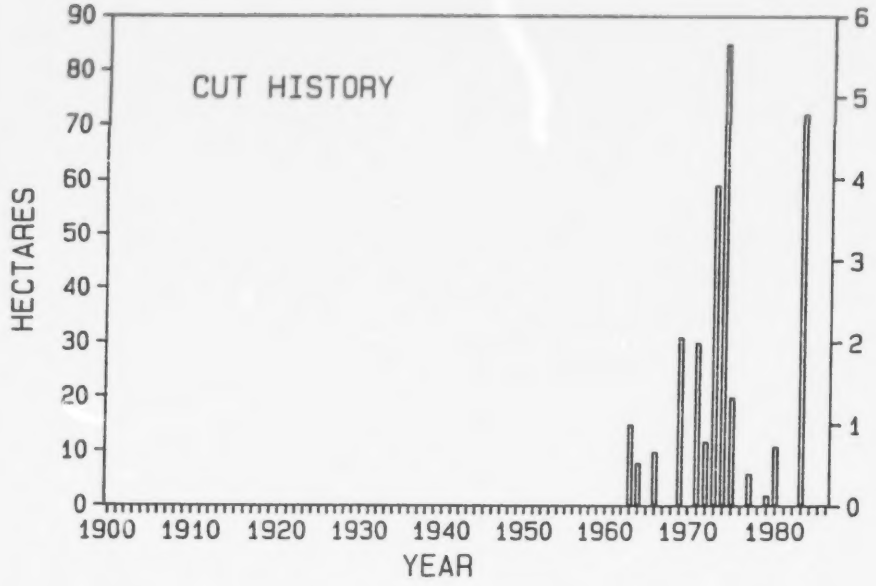


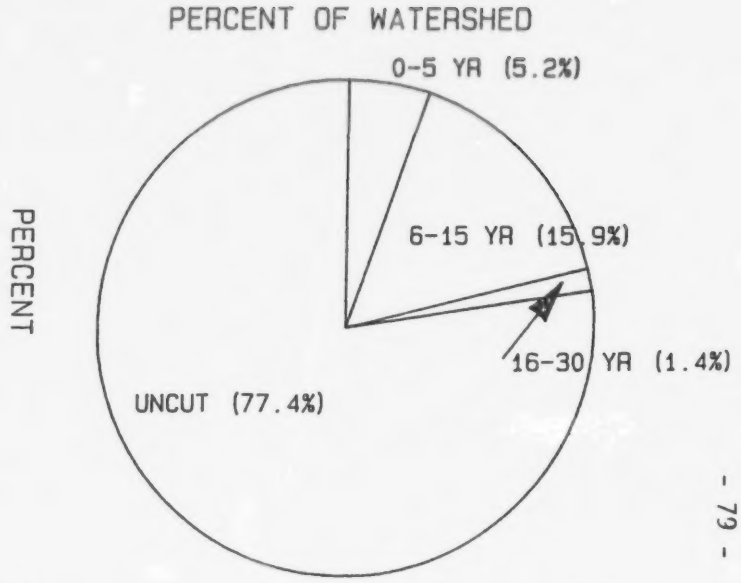


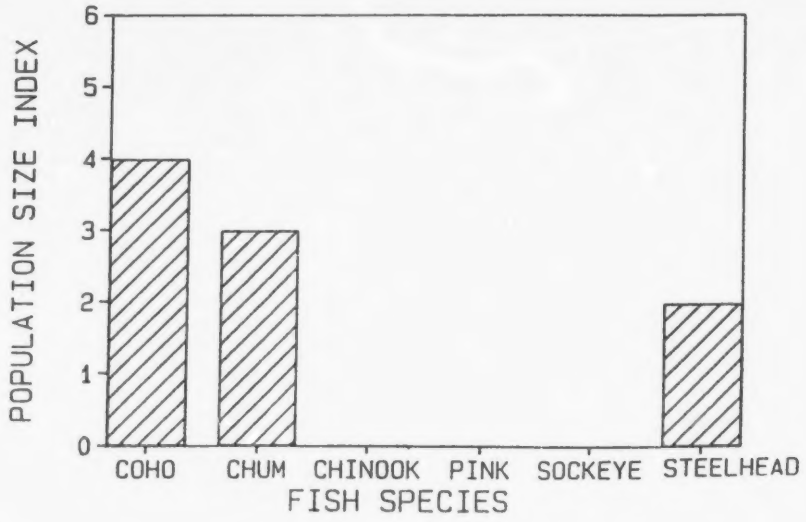
31. A number of small slides have entered the creek in the lower section. Watershed had very steep valley walls and "V" shaped valley with numerous small 1^{o} and 2^{o} tributaries entering throughout. Harvest commenced in 1974 and heavy silting was noted in 1975. A riparian zone was left for approximately 5 km. Excellent access from two roads which parallel the stream. Tributaries on north side have flat upper elevations with numerous small swamps and ponds.



Maggie River







32. Lower Maggie River and Maggie Lake have many small tributaries flowing into them. Most sections unlogged but openings 1971 to 1974 are available for study. Thus both logged and unlogged streams may be available for study. Both Draw Creek and Paradise Creek flow into Maggie Lake.

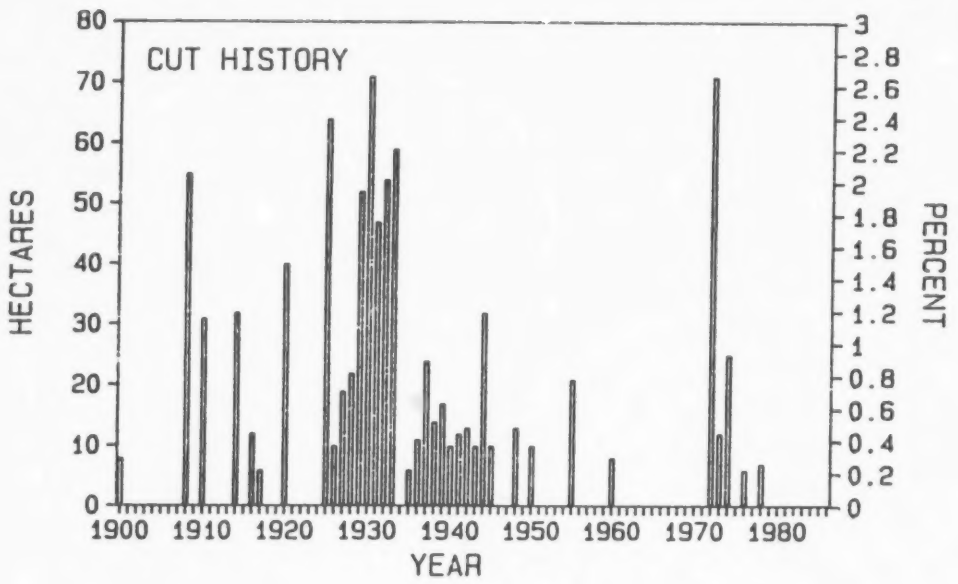
McBride Creek

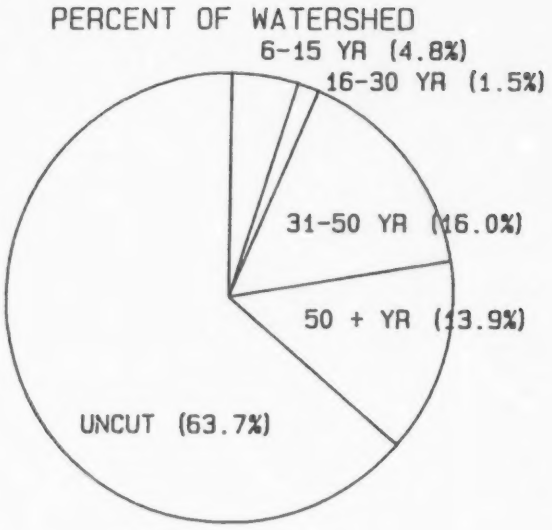
NO LOGGING HISTORY

33. Approximately 7% of watershed within Strathcona Park. Very poor access into watershed. Numbers and species utilizing system largely unknown. It appears as if no logging has been done to date.

NO FISH RECORDED

McFarland Creek

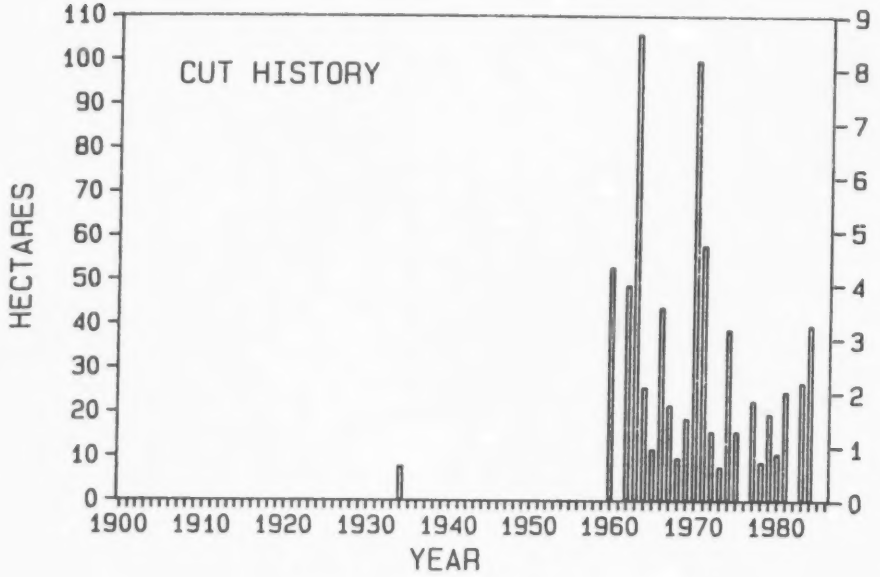


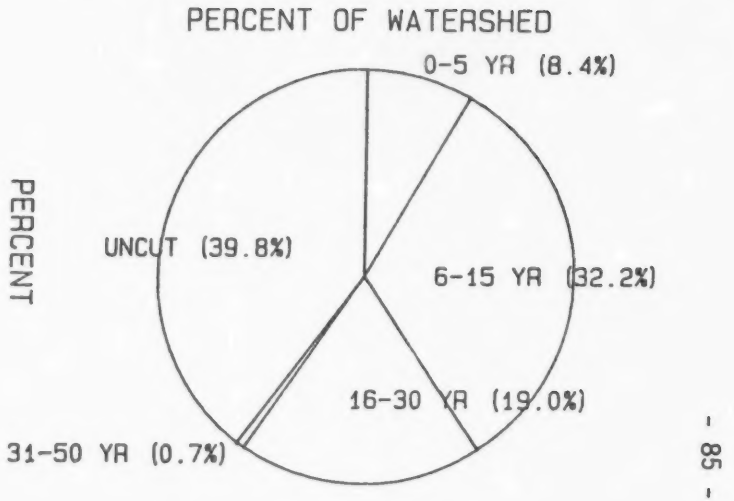


34. Large percentage of watershed is deeded land. There is a dam on this system and Port Alberni obtains its water supply from this watershed. Some industrial development has taken place (gravel pits and hog fuel dumps). Unsuitable for study.

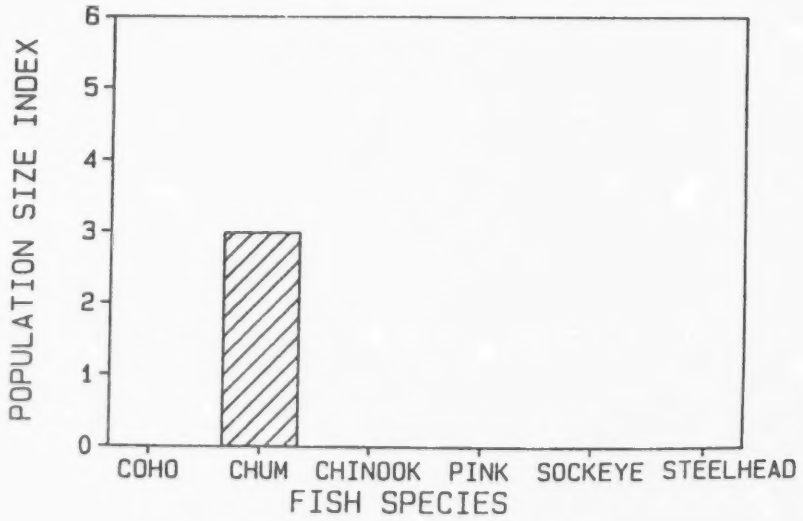
NO FISH RECORDED

Mercantile Creek





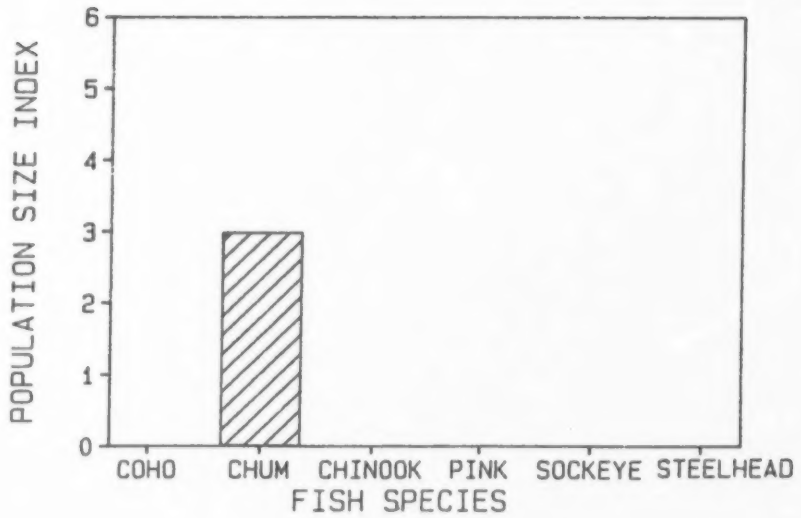
35. Approximately 11% of watershed is deeded. This creek has a hydro R/W in lower half of watershed. Ucluelet uses this creek for its water supply. Most of the creek openings are from 1960 to 1968. This system unsuitable for most forestry/fisheries studies.

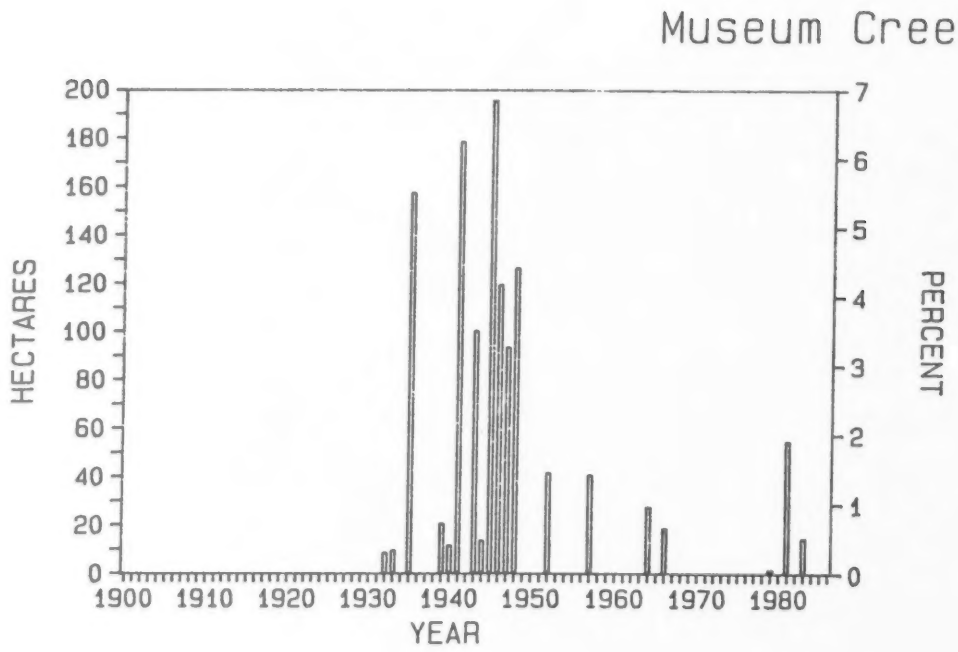


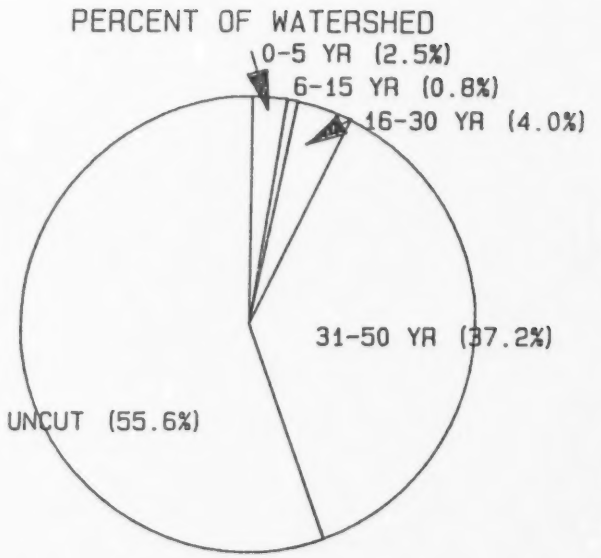
Mercer Creek

LOGGING STATUS UNKNOWN

36. This creek unsuitable for study because of high percentage of deeded land. Small swamp area (4 ha.) may have study potential but no coho have been reported in this system. Stream flows through Port Albion. Small section flows through old growth stand.







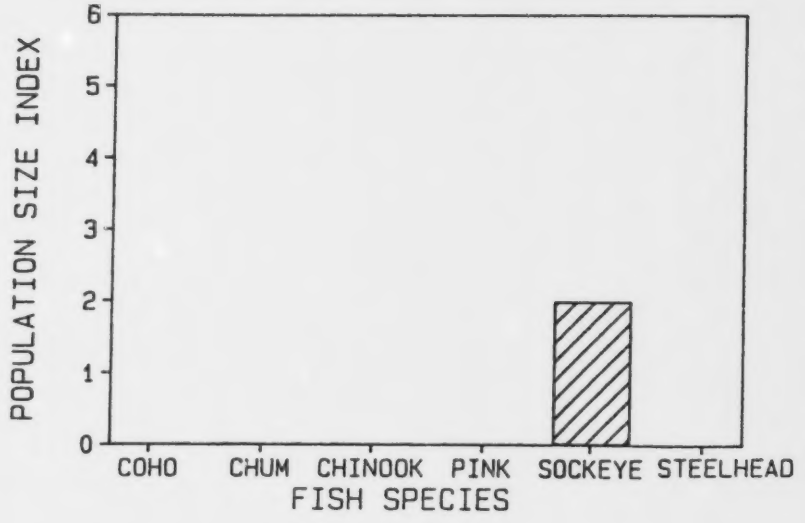
37. A large system which is devoid of anadromous species due to a falls within the Franklin River. Much of the early logging was done by railway and large openings along creek in 1946 are noted. The logging in upper section approaches alpine areas.

NO FISH RECORDED

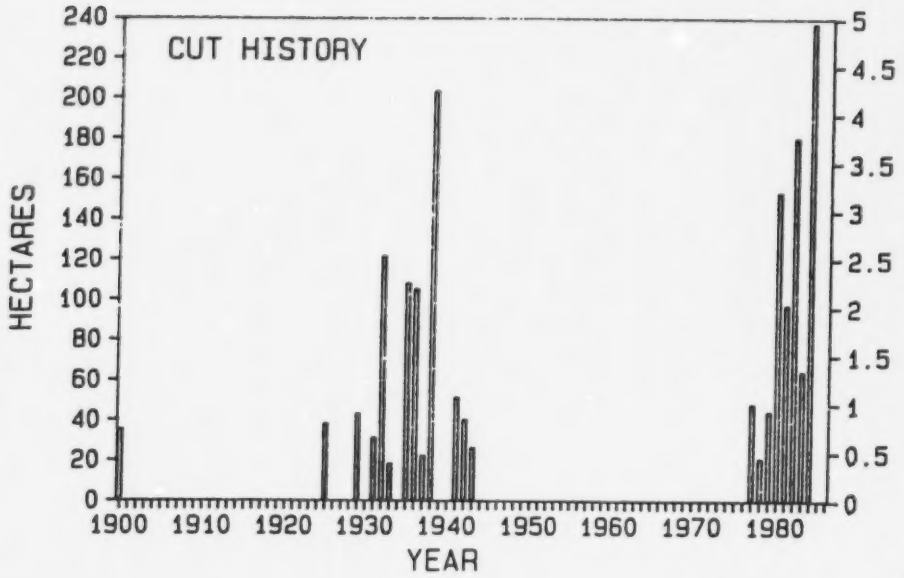
Nahmint Lake

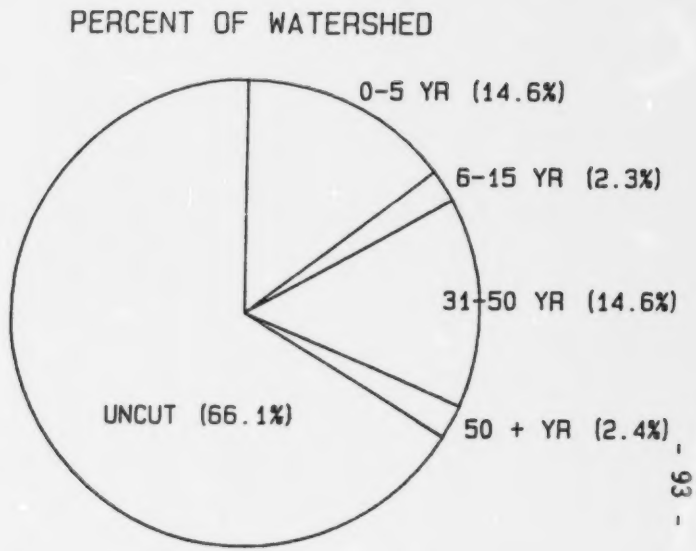
LOGGING STATUS UNKNOWN

38. Kokanee are present in the lake. Most of the lake faces are unlogged. Numerous tributaries to lake may offer paired designs but system lacks anadromous species.

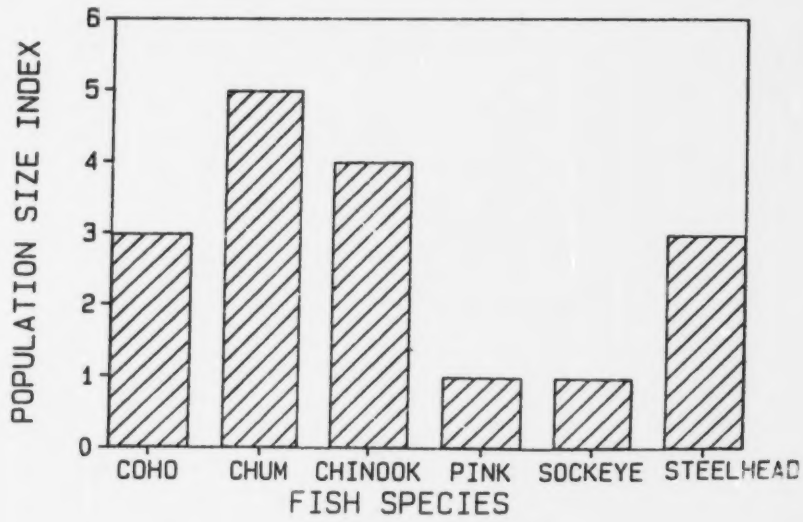


Nahmint River (Lower)

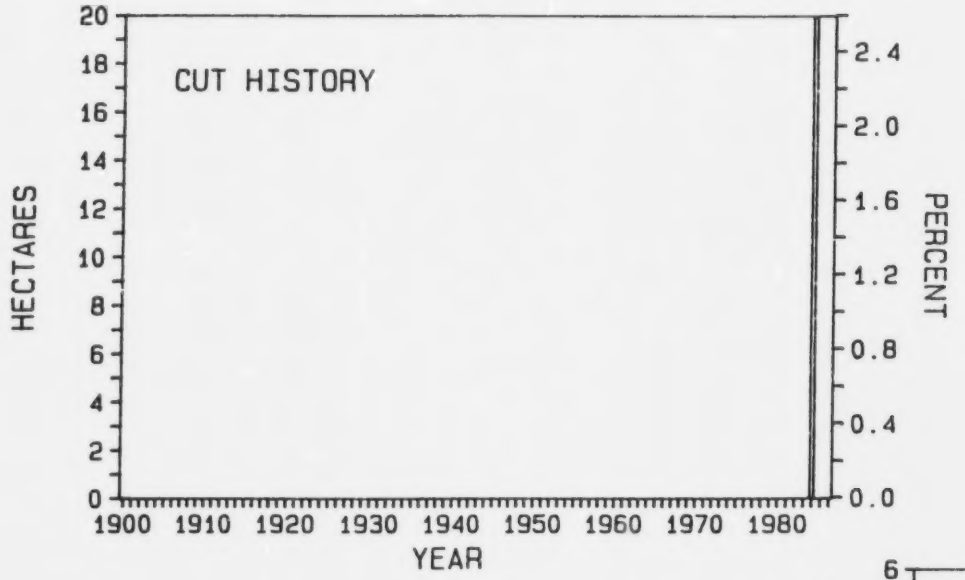


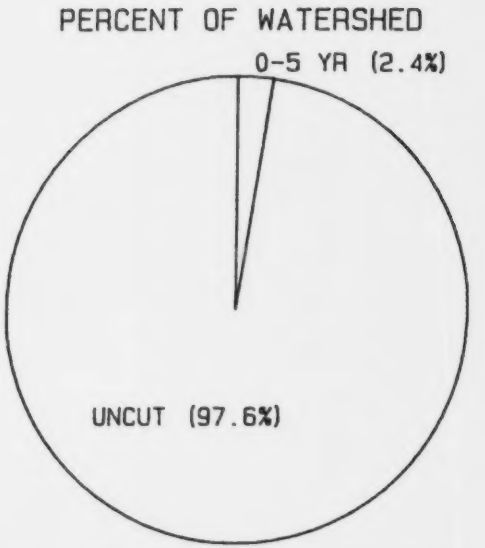


39. System is a good steelhead producer. Substantial estuary at mouth. Much of system logged by railway (1929-42) with numerous face openings along river. Only steelhead can get above the falls.

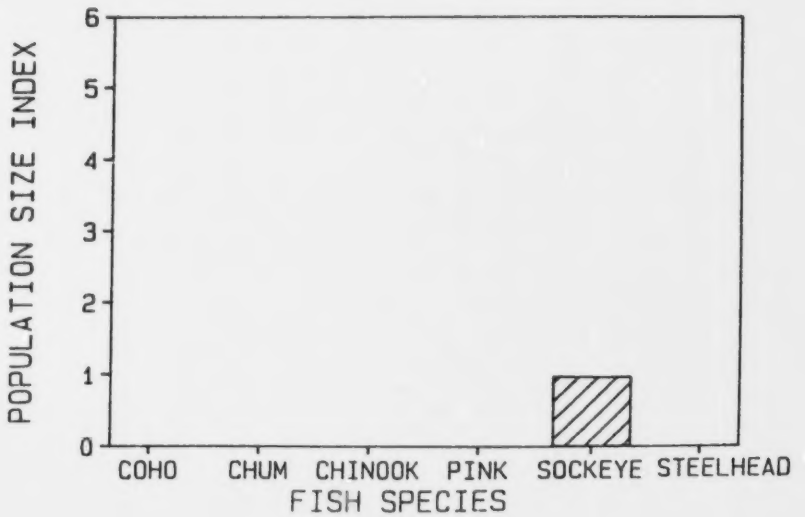


Nahmint River (Upper)

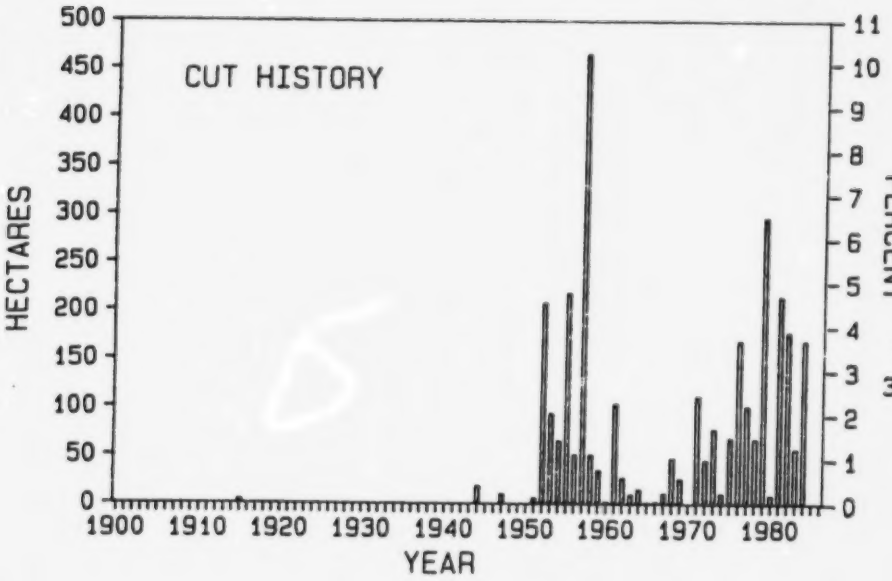


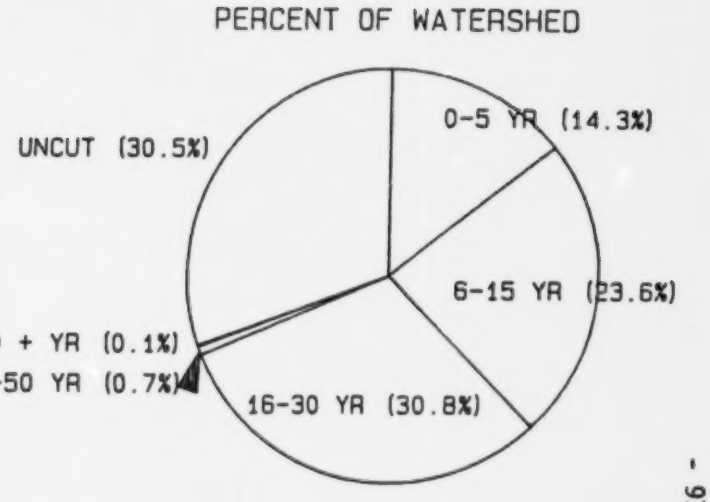


40. No anadromous fish are present in upper Nahmint River. There are small ponds and lakes at higher elevations. There are numerous rock slides in watershed. Kokanee are present in the lake and may use upper sections of the river.

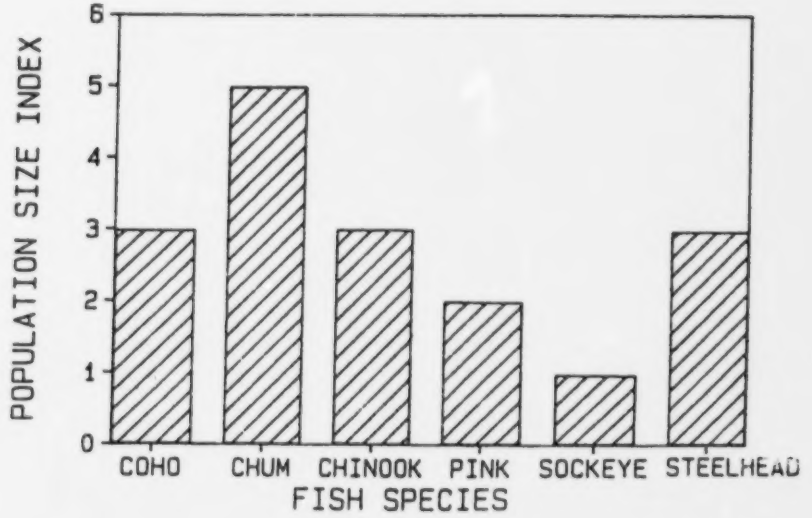


Pachena River

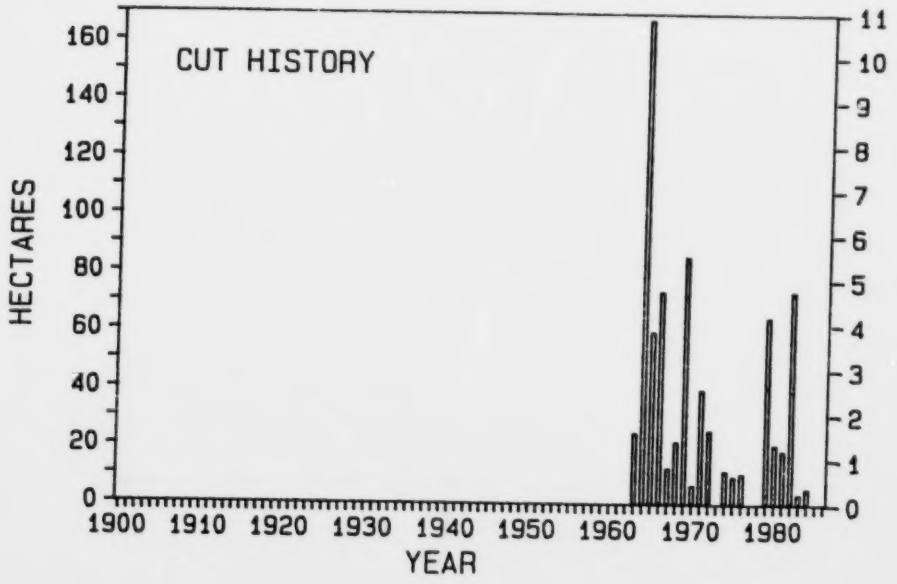


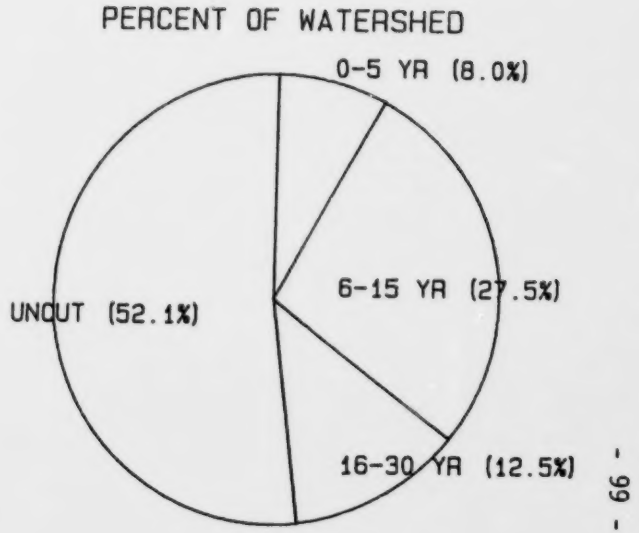


41. Numerous swamps and ponds are available for study with numerous openings from 1952-84. Excellent access to all areas. It may be difficult to find unlogged areas for control sections. An excellent study possibility exists in Kichha Lake tributary which is not part of Pachena River, but enters directly into ocean. It is entirely within park boundaries.

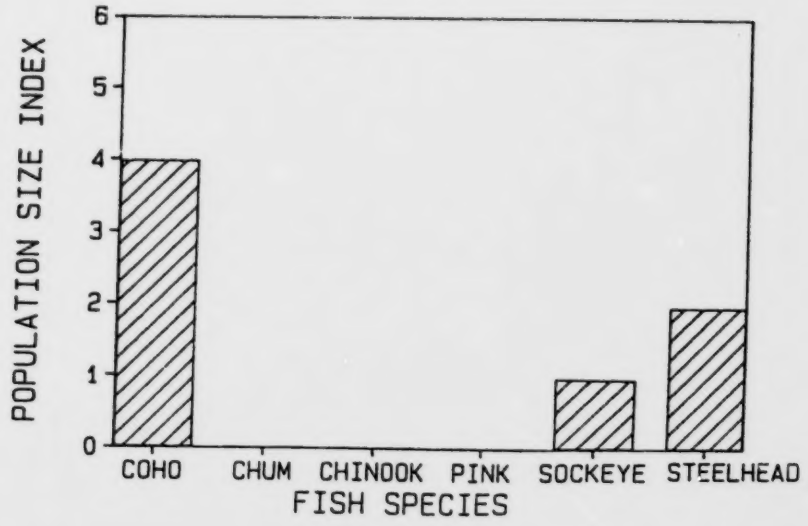


Paradise Creek

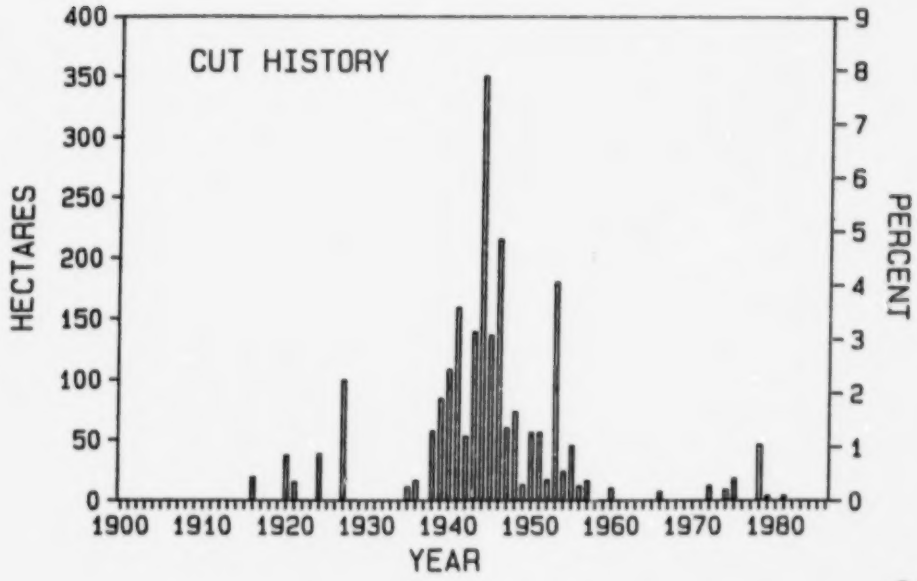


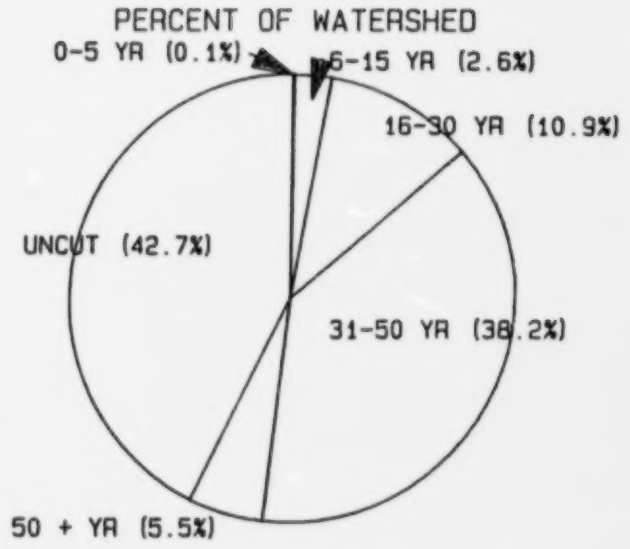


42. The lower channel has lots of good spawning area and it braids into numerous channels where it enters Maggie Lake. Numerous other small first and second order streams also enter this lake and these may be useful for juvenile migration studies. Lower sections of stream largely unlogged.

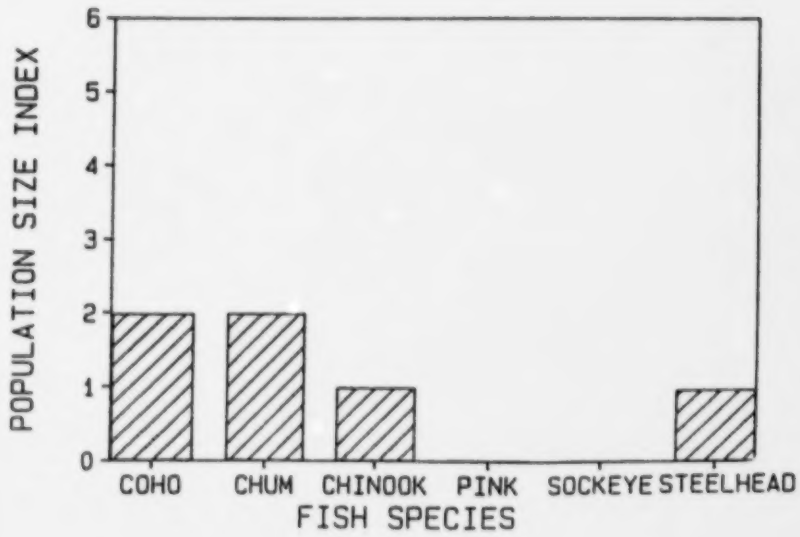


Parson's Creek





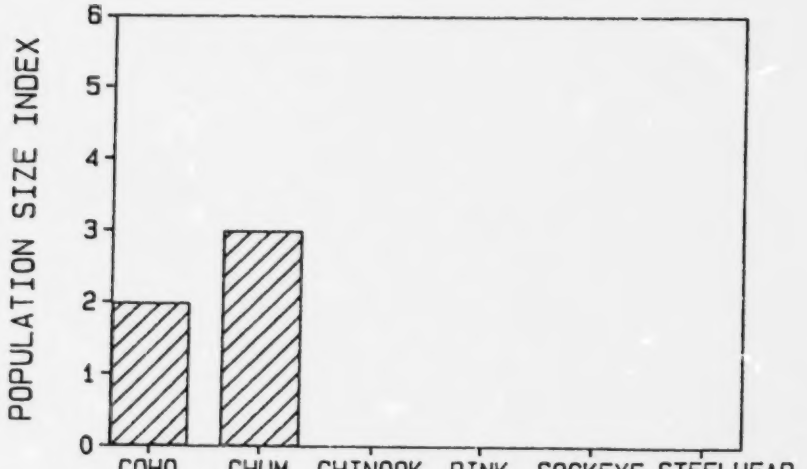
43. A series of cuts in lower section was made in 1944. Some logging done by railway. All lakes and ponds are well above upper limits of anadromous access. Two lakes of similar size with different history, one logged 1939-45, the other unlogged as of 1984.



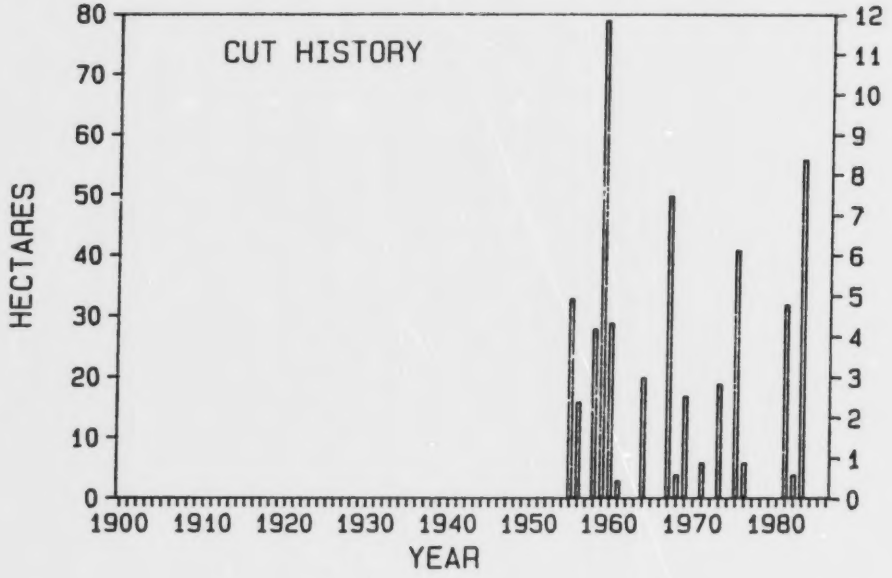
Pipestem River

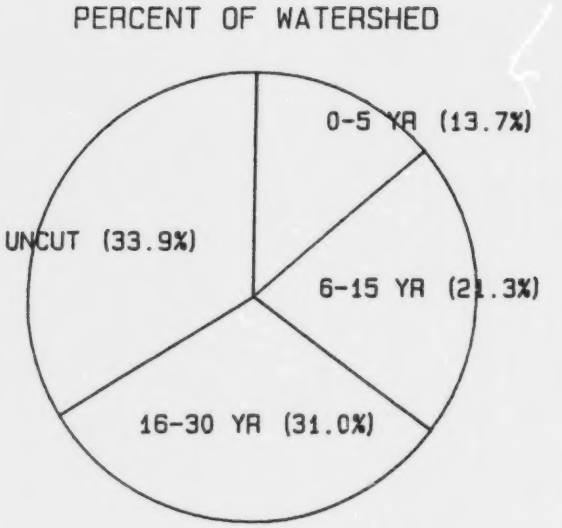
NO LOGGING HISTORY

44. No logging up to 1984. May have potential as a control stream. Numerous small streams enter Pipestem Inlet including some with small lakes. These may have study potential. Gradient of stream is steep and substrate is composed of boulders.

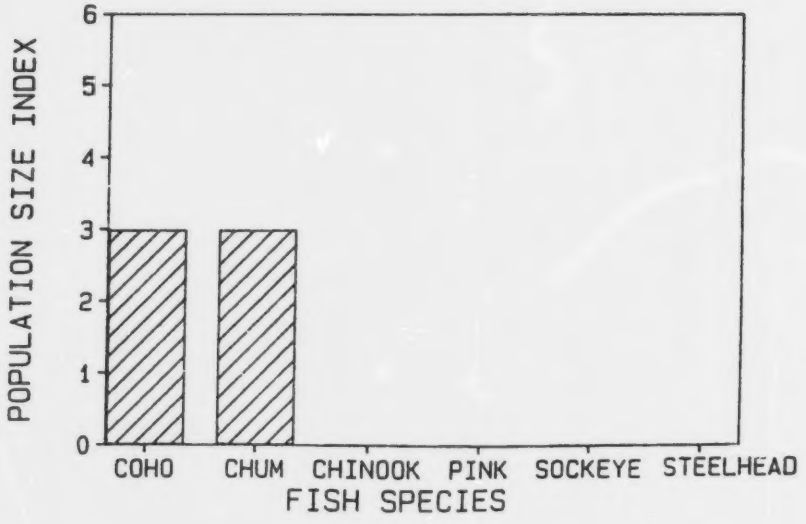


Poett Nook Creek

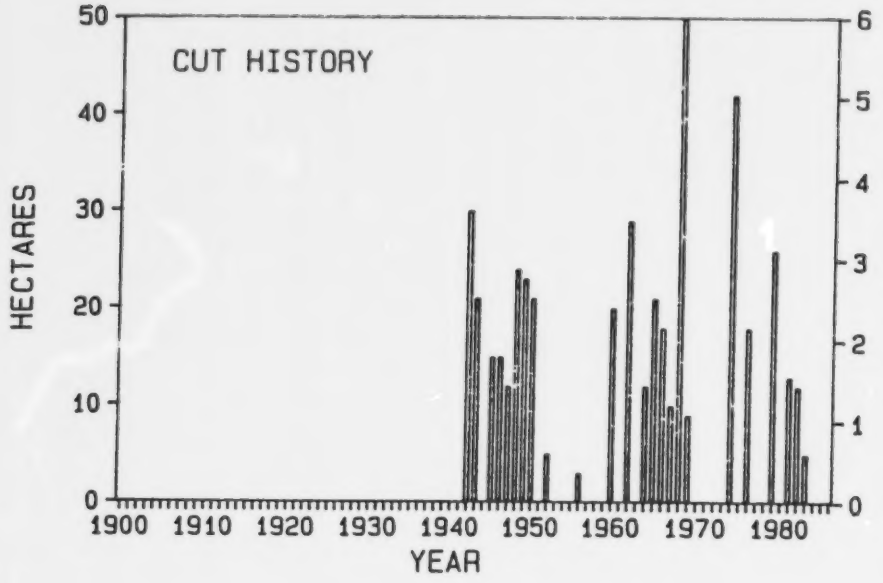


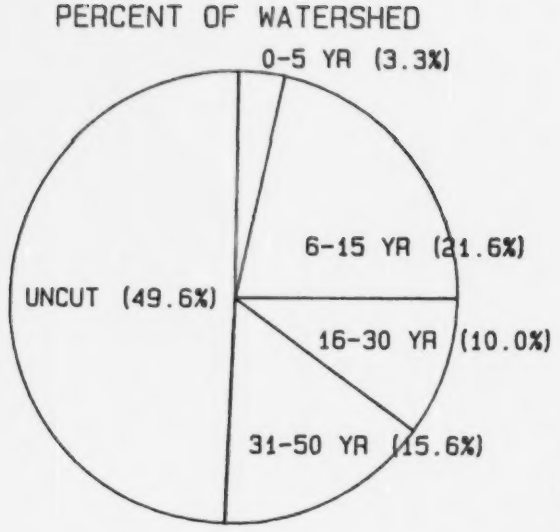


45. Small stream has excellent study potential as it has a range of habitat types within accessible length, substantial runs of coho and chum, excellent moorage at mouth within a confined bay and a good road network throughout. Extensive openings 1958-59. Two small lake or pond fed tributaries have good study potential. Beaver activity has been noted during last few years, especially within the lower section.

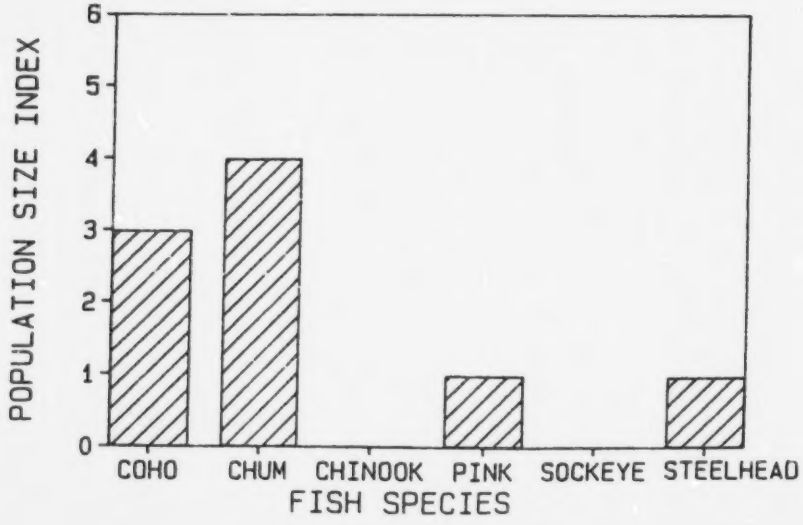


Salmon Creek

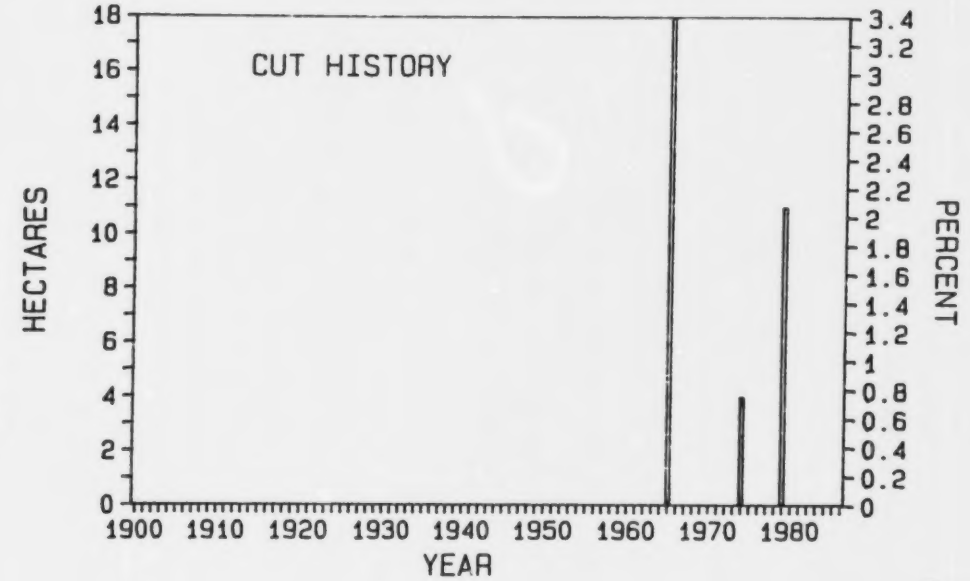


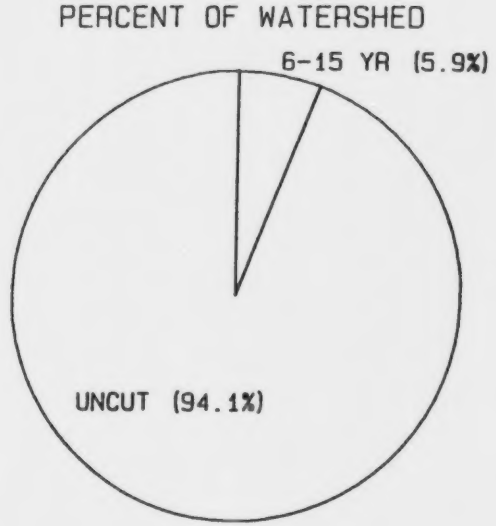


46. Two of the tributaries cross the Tofino highway. Numerous small swamps, ponds, and lakes exist in lower half of watershed which has study potential. Only 52% of the watershed remains in TFL 44. Sections of creek harvested in 1943 to 1950 may be of interest.

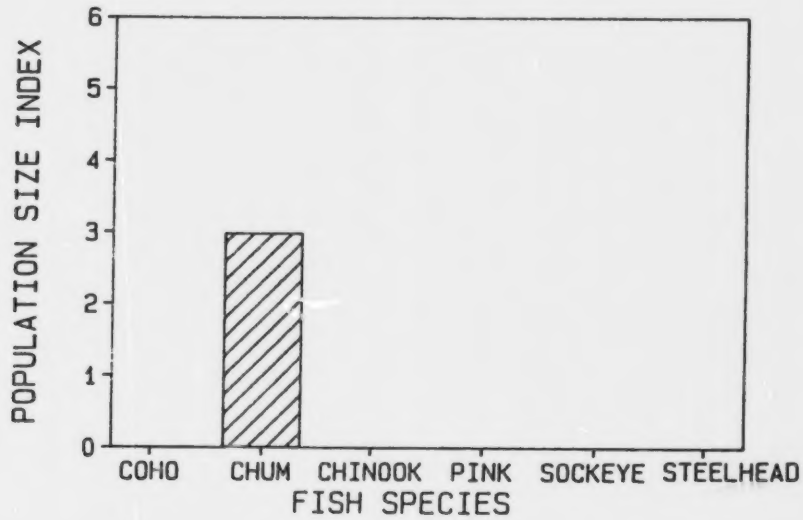


Sandy Creek

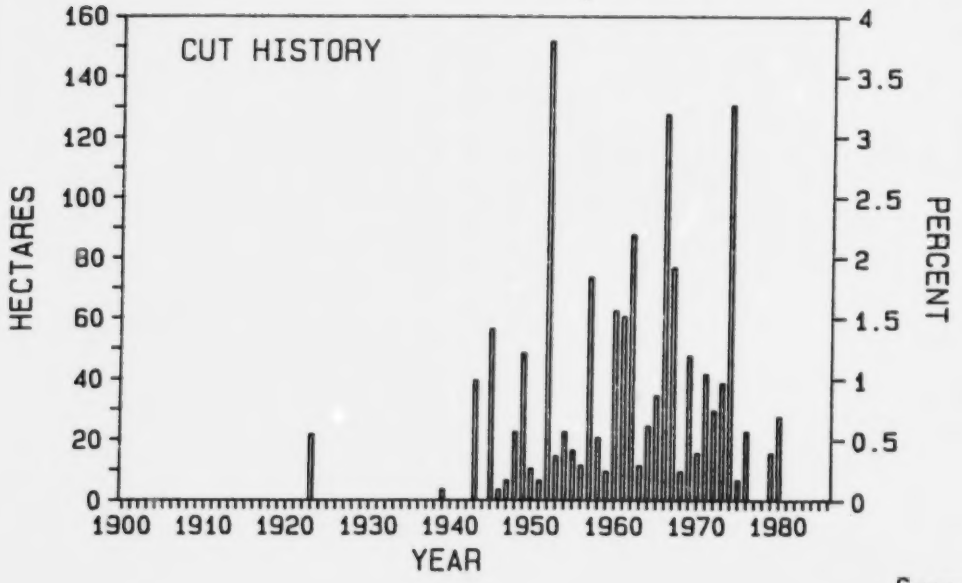


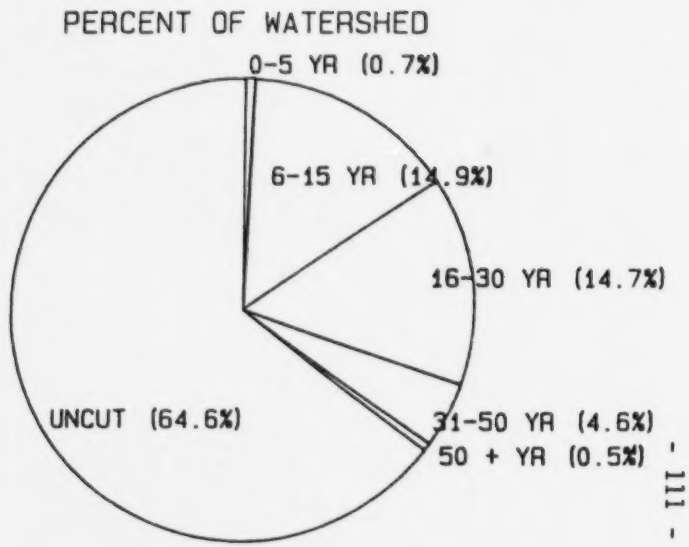


47. Small dam at 1 km. Only 44% of watershed is within TFL 44. The remainder is deeded land and Indian land. This watershed appears to be unsuitable for study (Fish/Forestry) due to high degree of land alienation already apparent.

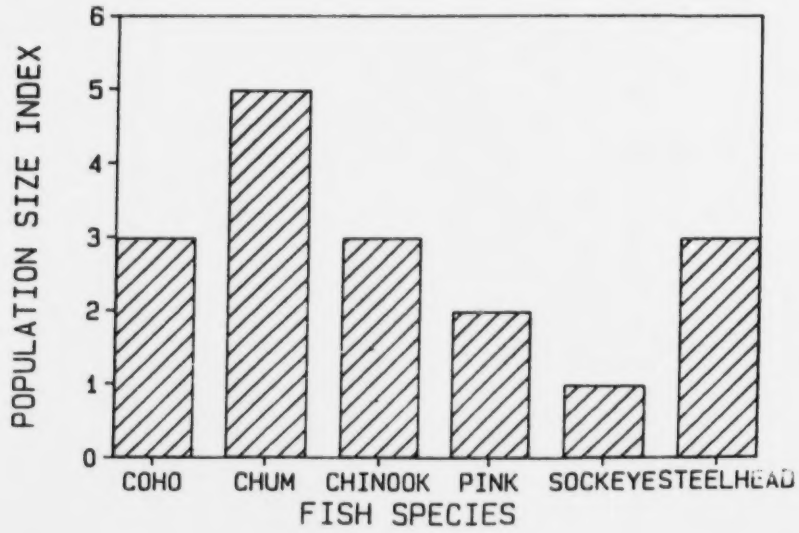


Sarita (Lower)

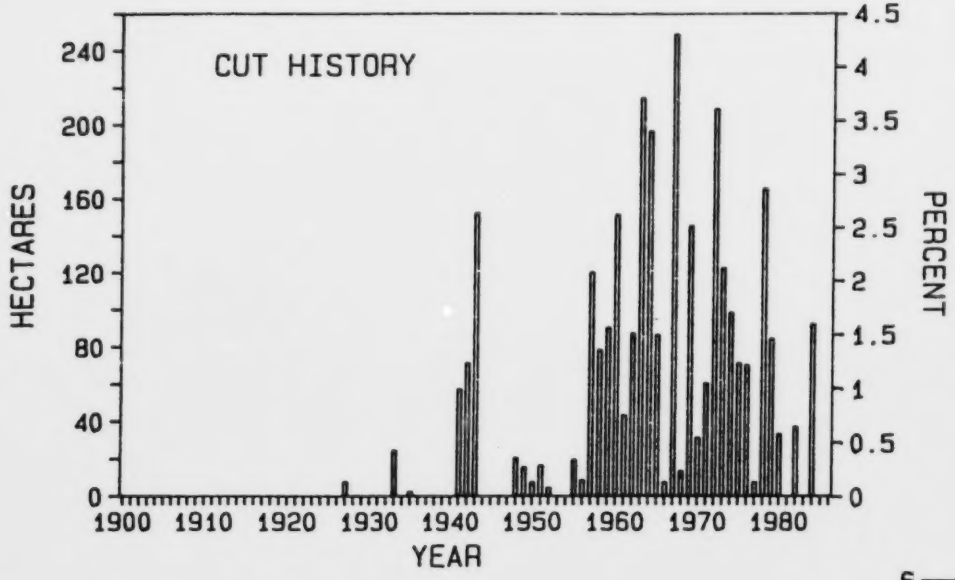


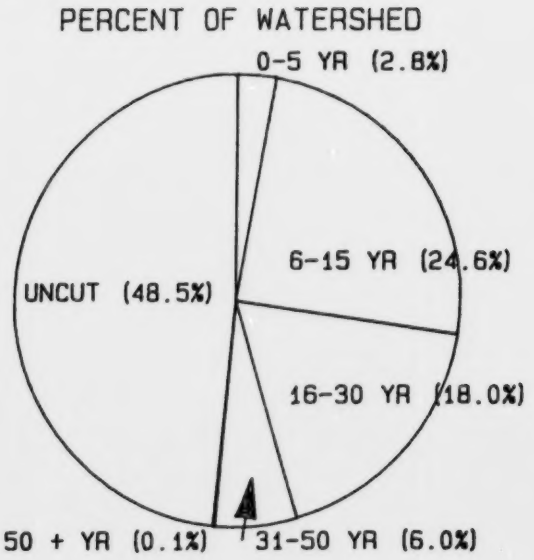


48. Heavy native fishery on river. Large estuary within Indian Reserve lands. Extensive flood-plain with numerous swamps and ponds throughout. Not suitable for study.

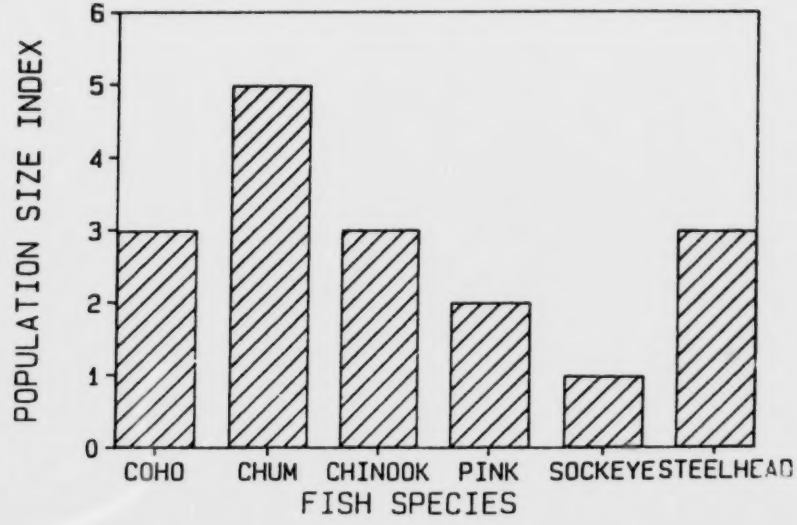


Sarita (South Fork)

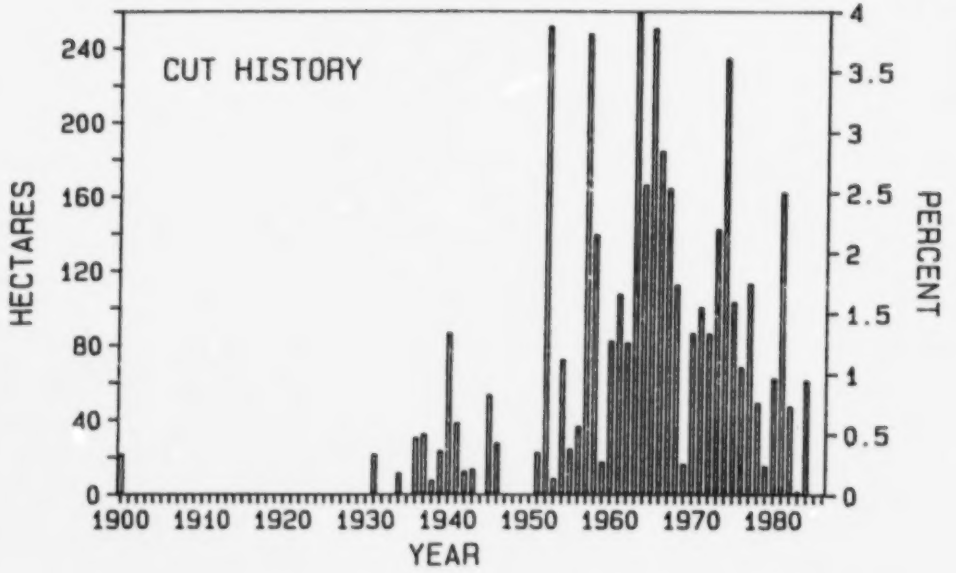


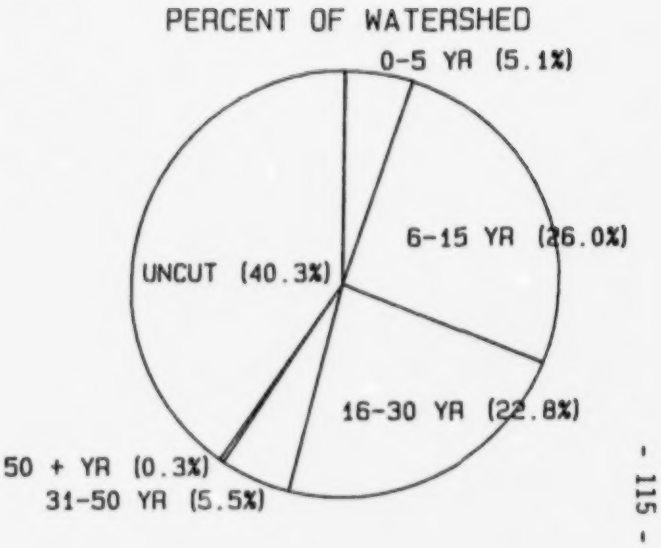


49. Small swamps and ponds off Branch 121 and Sarita Mainline may be of some study value. Leave strip along lower reaches by surrounding areas were logged 1968-70. Due to intense native fishery in this river, this river has very little study potential.



Sarita (Upper)

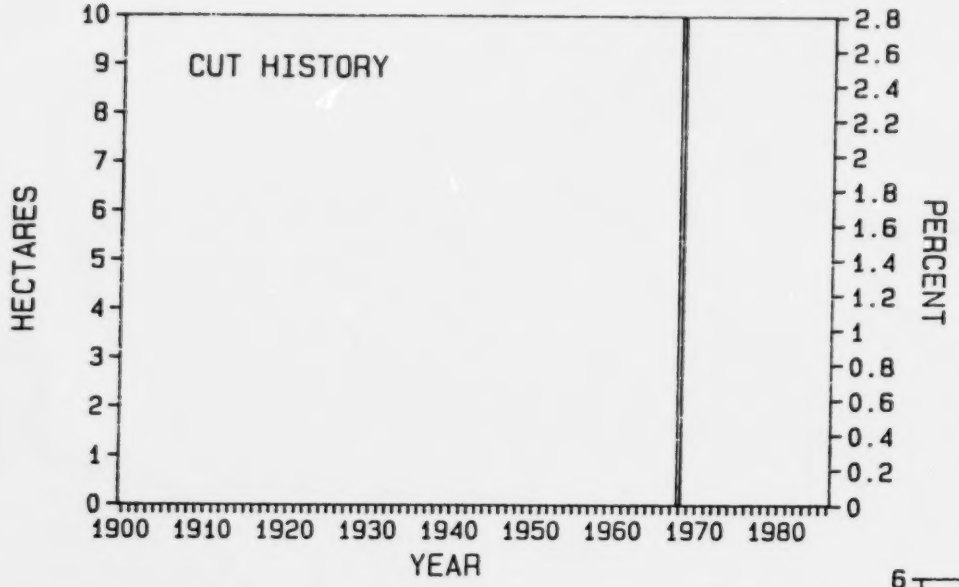


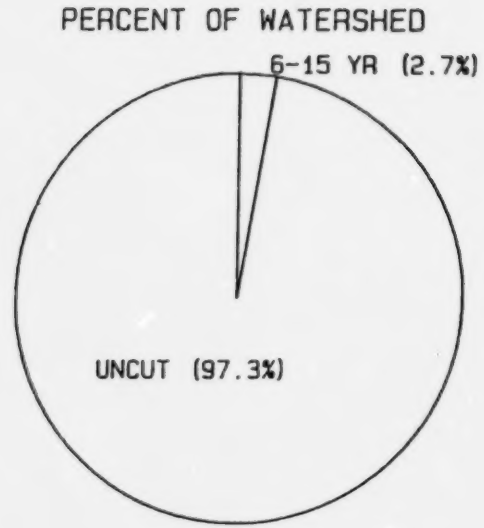


50. Anadromous salmonids have no access into Sarita Lake due to falls. Trout fishing is active above falls.

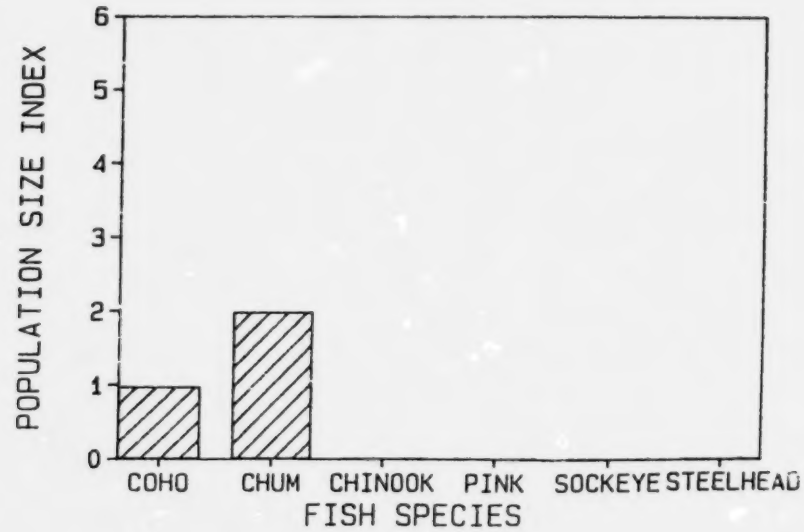
NO FISH RECORDED

Sechart Creek

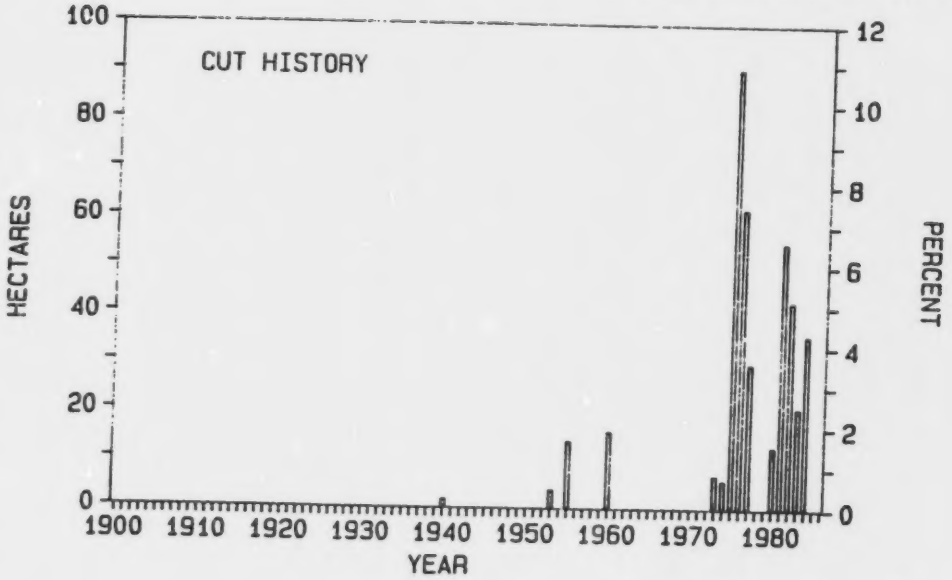


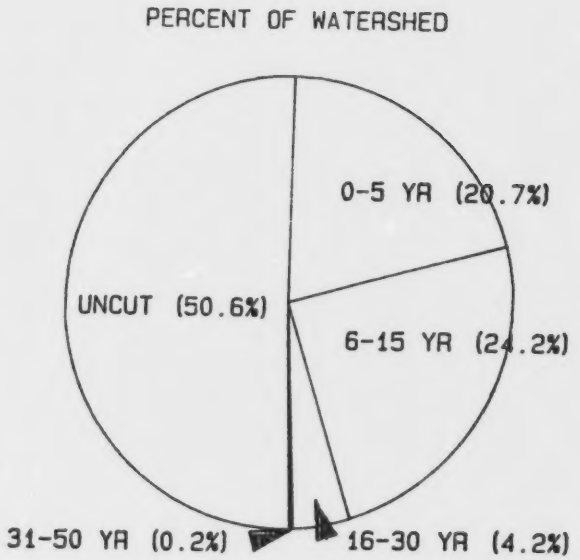


51. A small section of logged land at mouth of creek. An impassible falls is present at 0.1 km. Unsuitable for study due to short accessible section.

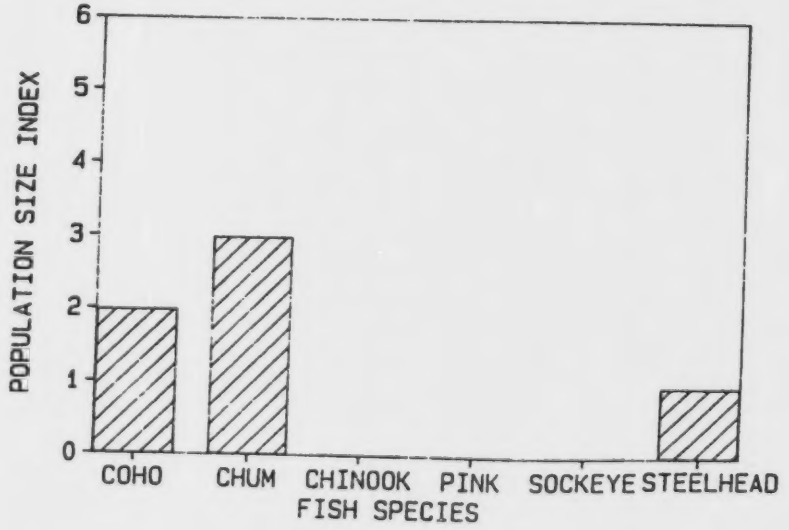


Snug Basin Creek

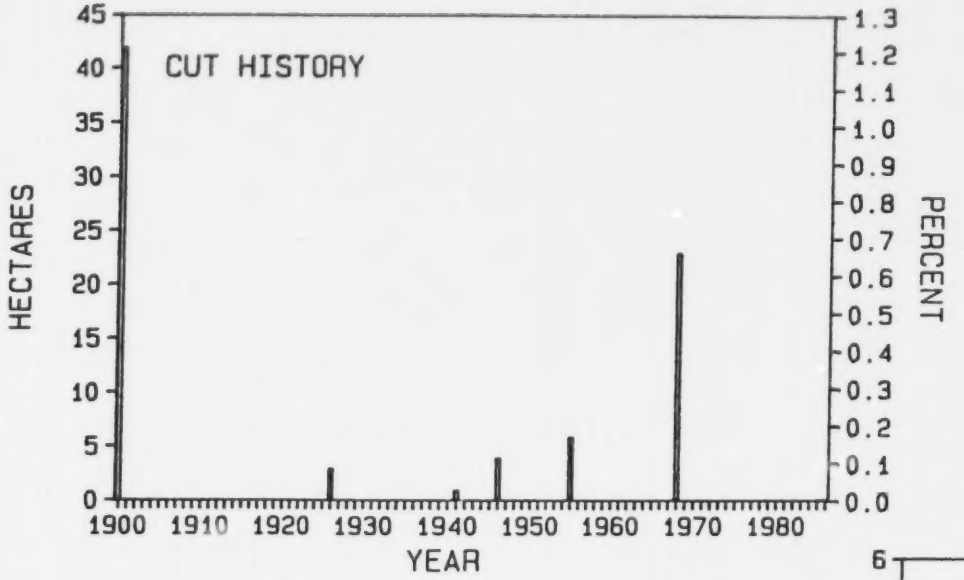


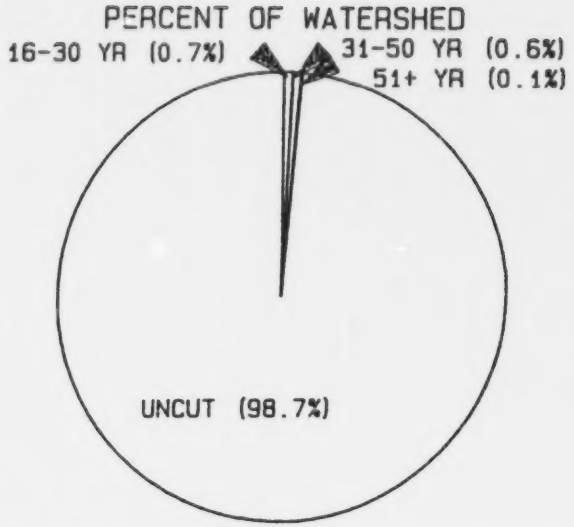


52. Well protected bay suitable for moorage and early salt water residence studies. A leave strip in lower section may be of interest. The upper 24% of the watershed is TSA. Major openings 1976-82 without leave strip.

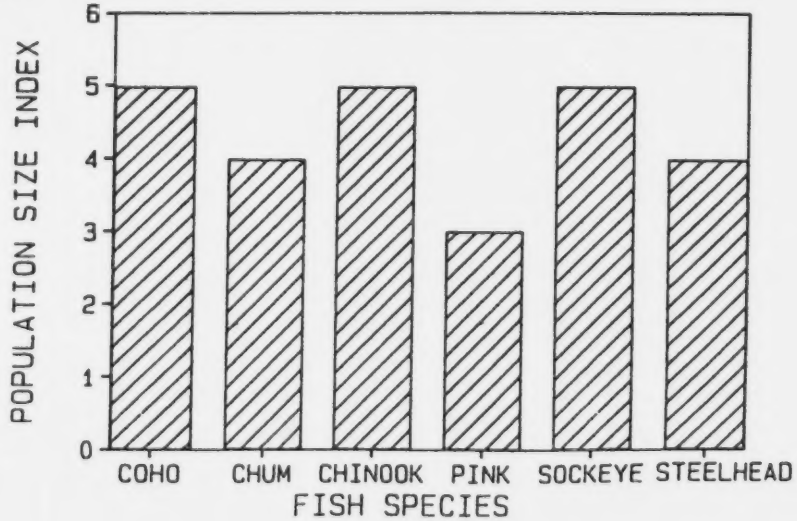


Somass River

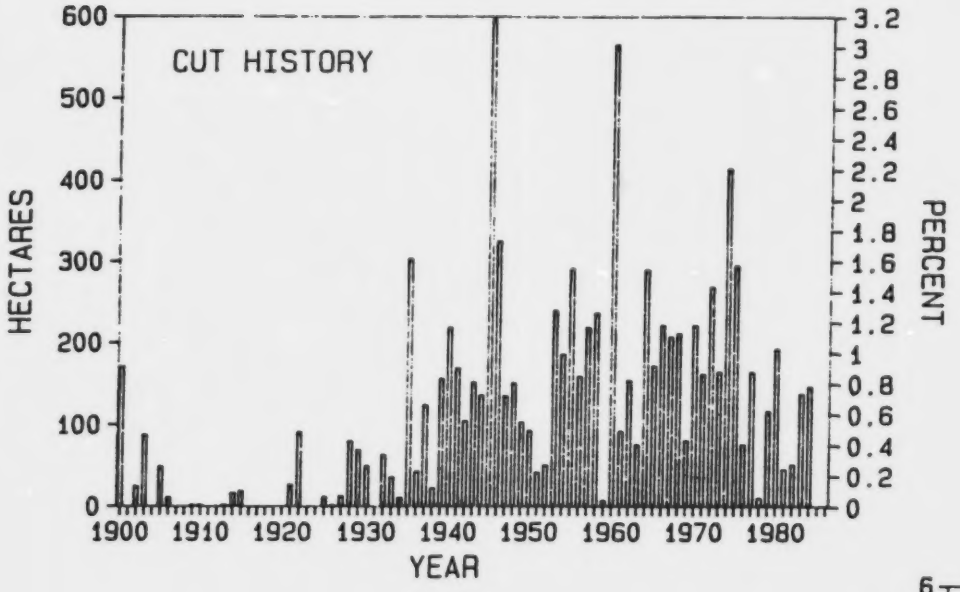


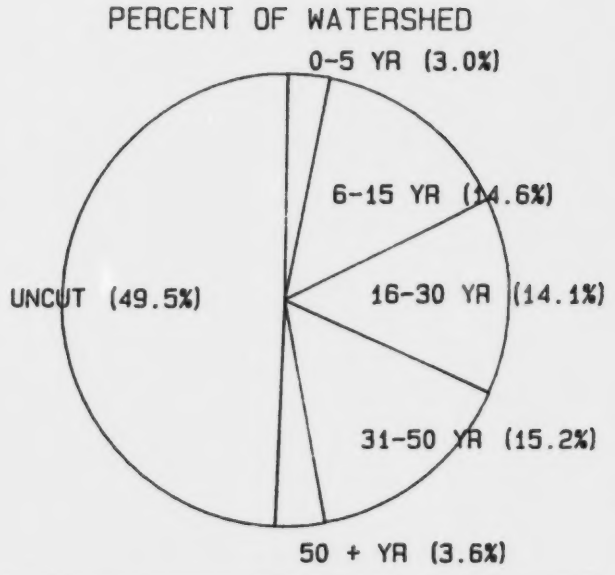


53. Estuary and river largely urban and may be affected by effluent from pulp mills and sewage from city of Port Alberni. Active native fishery on system. Water is withdrawn from system by industry. At least two major spills of petroleum products have occured within river (1976-78). River is affected by treatments within watershed, such as lake fertilization. Large percentage of river is deeded land. Numerous systems feed this river, these include: Stamp River and Ash River, upper and lower. Only a small section of watershed is within TFL 44 and it is totally logged.

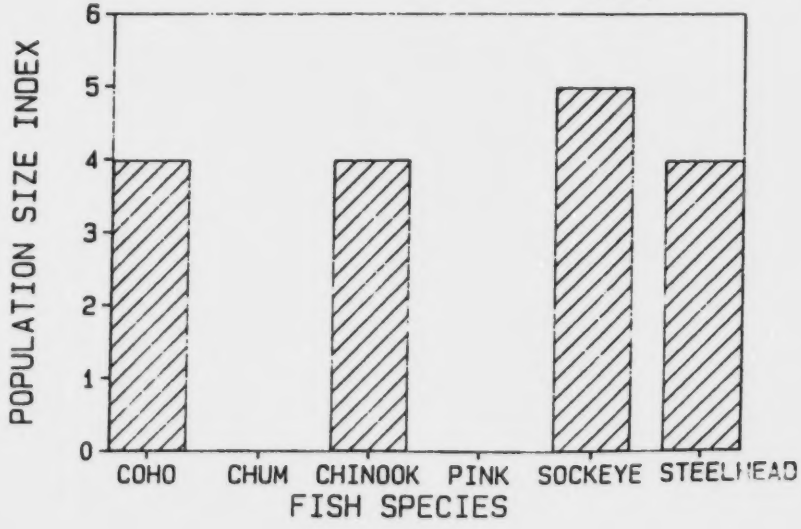


Sproat Lake & River

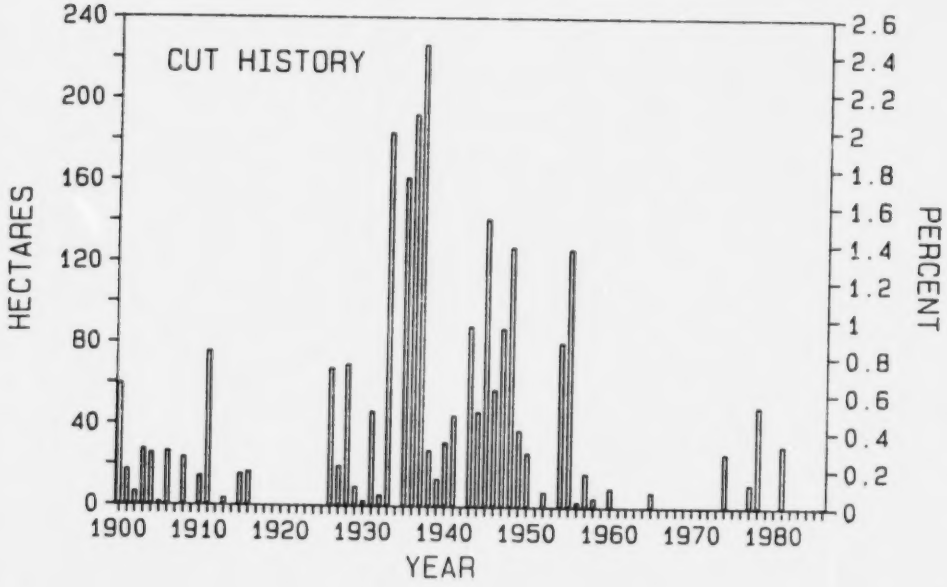


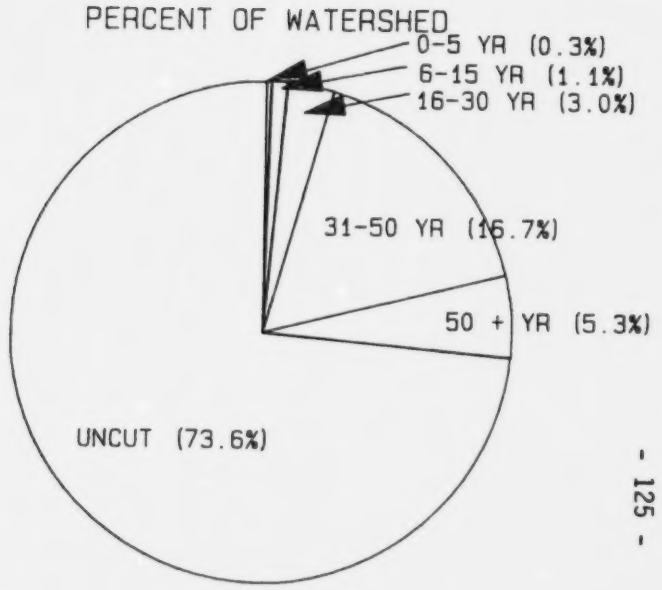


54. This section includes Sproat Lake and 1.0 km of river to junction of Sproat and Somass drainages. Taylor River flows into the lake at western end. Numerous tributaries flow into the lake on both south and north sides and many of these have smaller lakes and ponds within their drainages. Over 50% of this section has been harvested from 1858 to present. The lake has been fertilized for sockeye enhancement program. A concrete dam on Sproat River channelizes water through fishway.

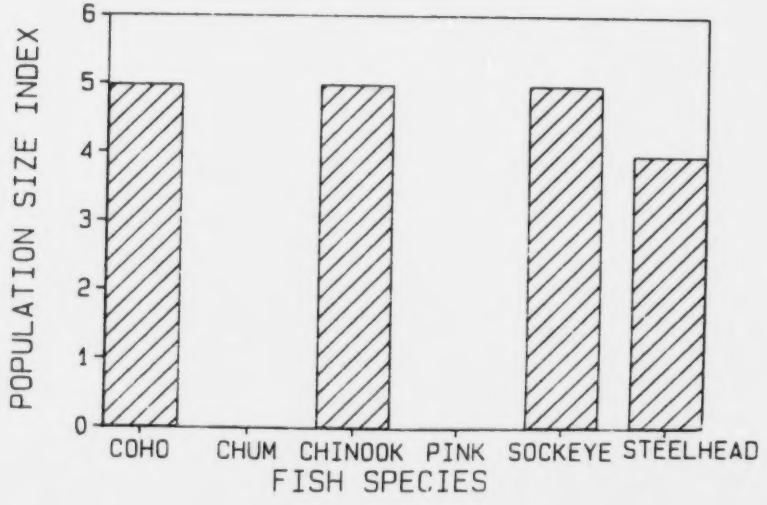


Stamp River

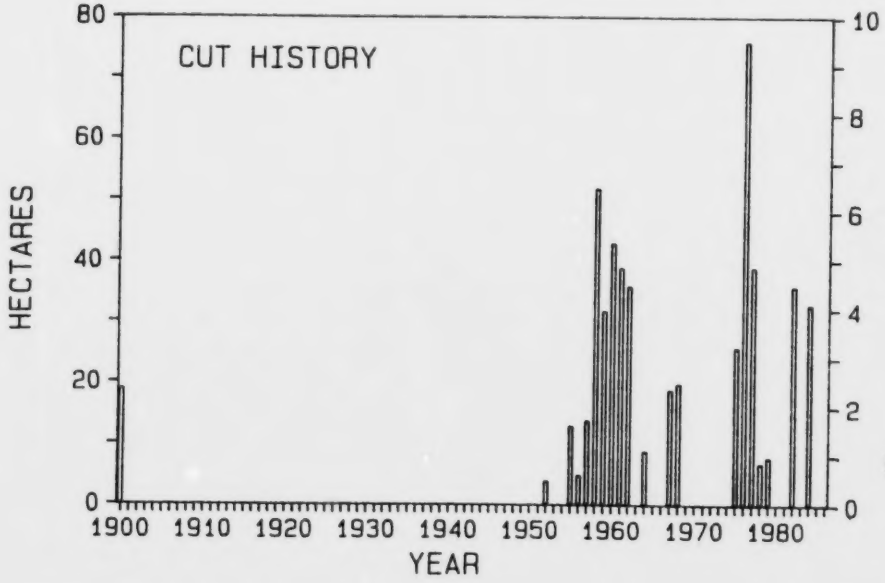


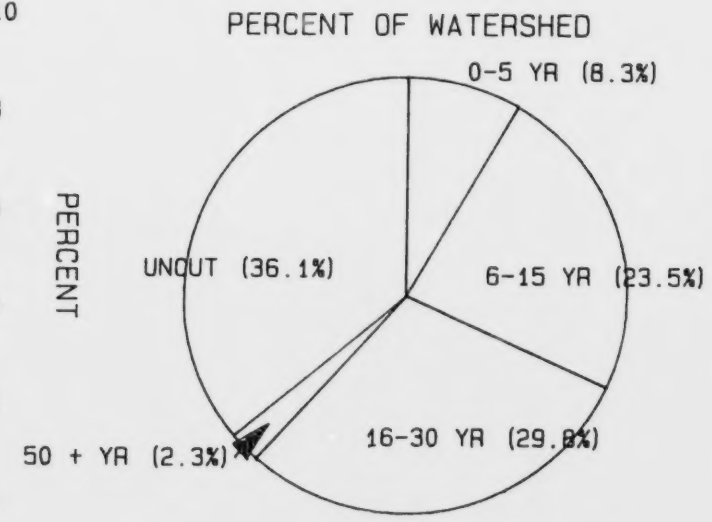


55. A large percentage of this watershed (63%) is deeded land without cut information. Steep hillsides logging effects could be studied in some of the tributaries. The Stamp River has fishways to allow salmonid passage.



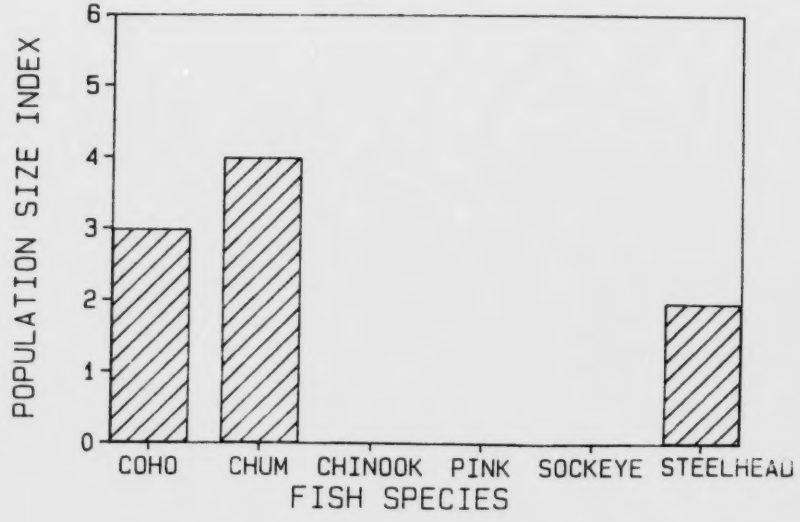
Sugsaw Creek



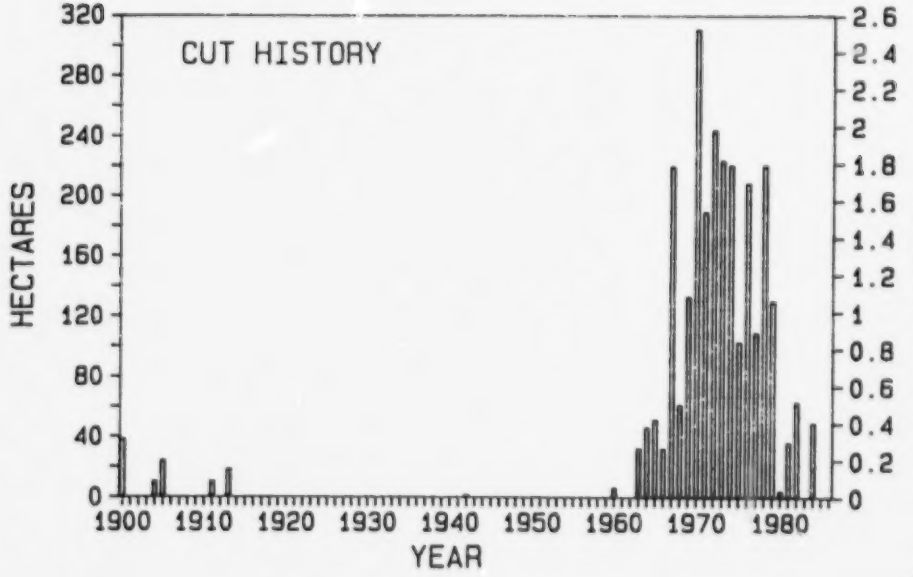


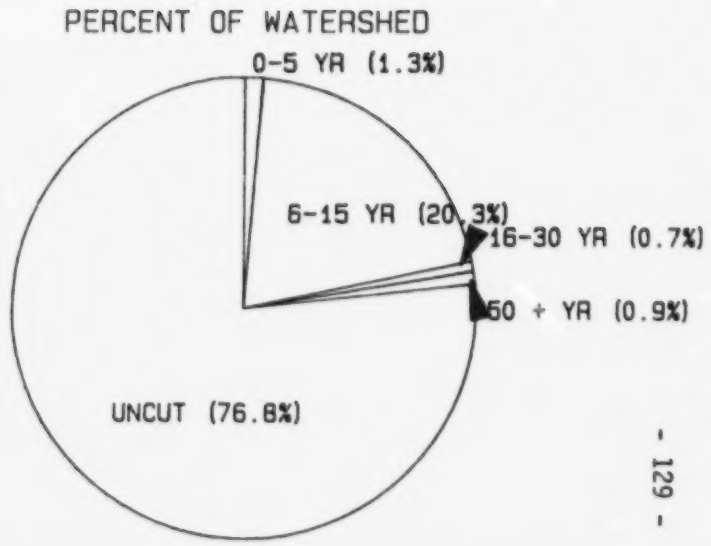
56. Sugsaw Creek flows into Grappler Inlet, which is a well protected area. As inlet has a very narrow mouth, this area may be of use in studying early seaward movement. The upper lake area is not accessible to anadromous fish but may have good potential for studies on salmonid out-planting. Approximately 10% of the watershed is in lakes.

The lower 0.6 km of stream is accessible and this section contains "face" openings in 1960 as well as some old growth. Watershed was logged from 1950 to present. Small settlement (reserve) at mouth of creek and watershed is used as the water supply for much of Banfield.



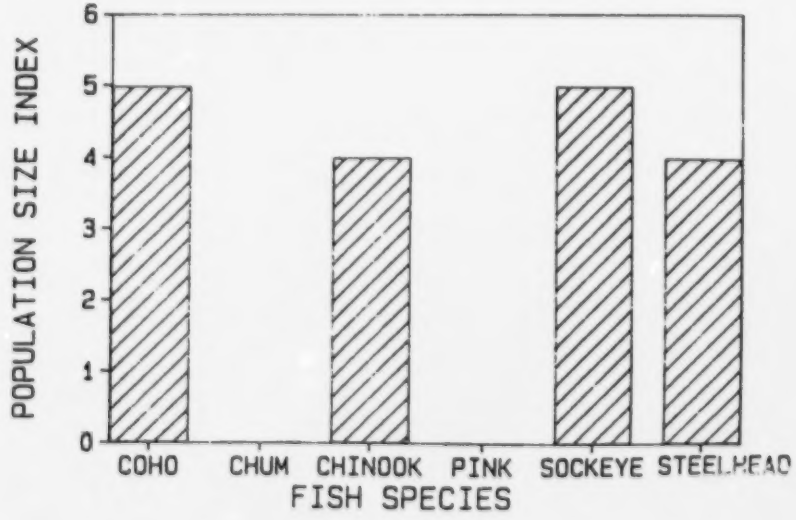
Taylor River

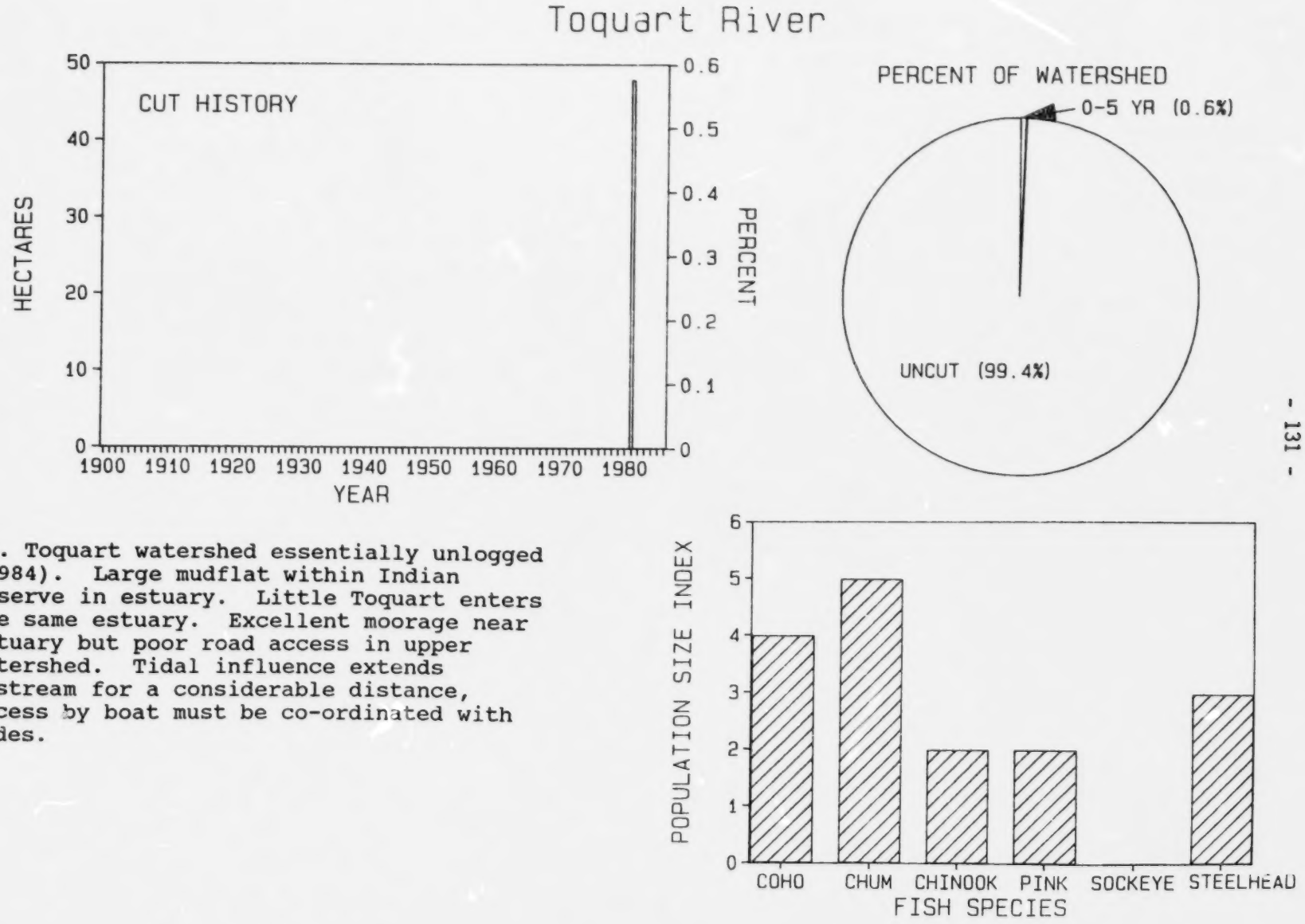




57. To date (1985) one large tributary (stream order 5) is unlogged, one other tributary (stream order 3) is largely logged. These could form a study pair. Good access throughout by road. Taylor River flows into Sproat Lake.

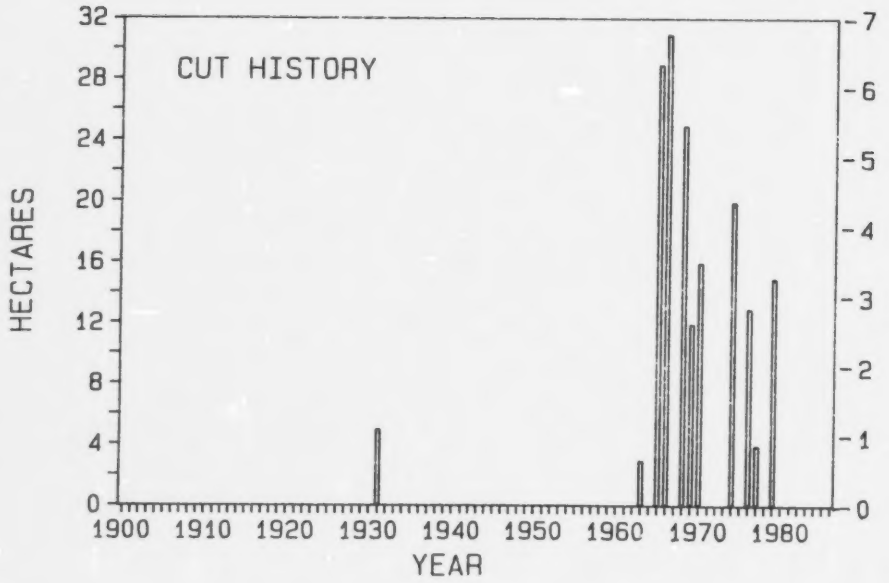
Most of the logging activity took place 1964-79 along river. Some early logging done in 1872.

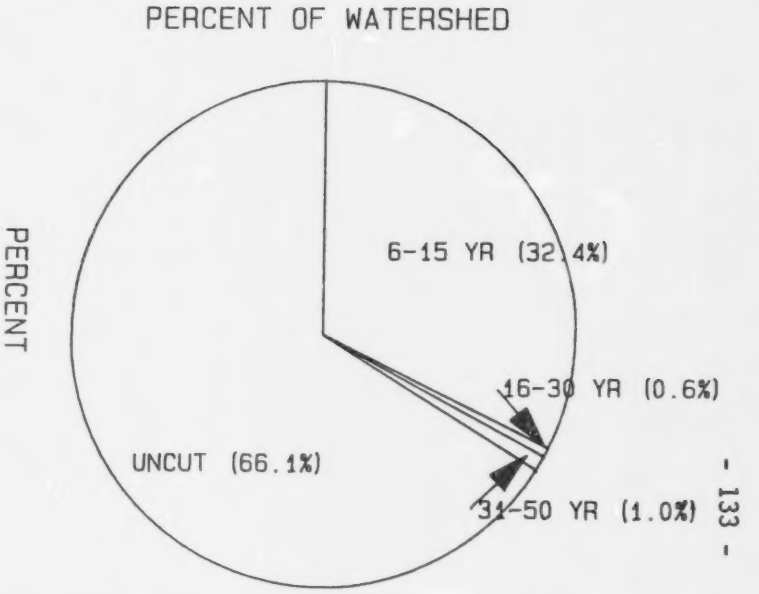


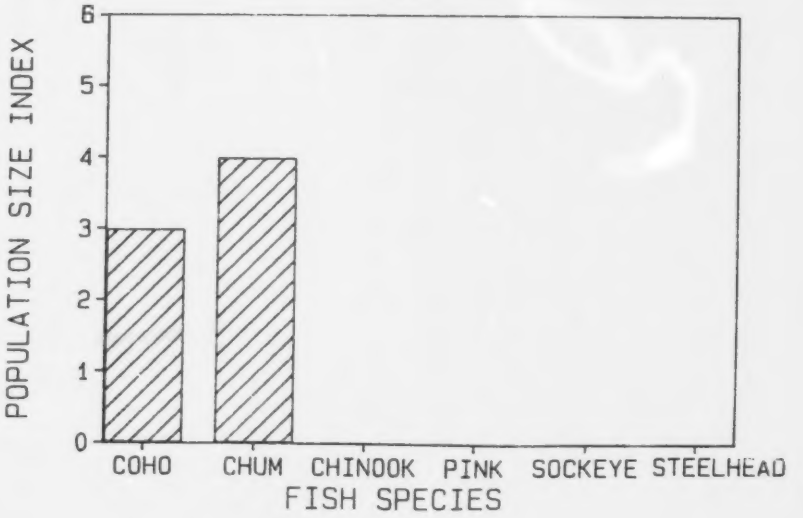


58. Toquart watershed essentially unlogged (1984). Large mudflat within Indian Reserve in estuary. Little Toquart enters the same estuary. Excellent moorage near estuary but poor road access in upper watershed. Tidal influence extends upstream for a considerable distance, access by boat must be co-ordinated with tides.

Two Rivers East



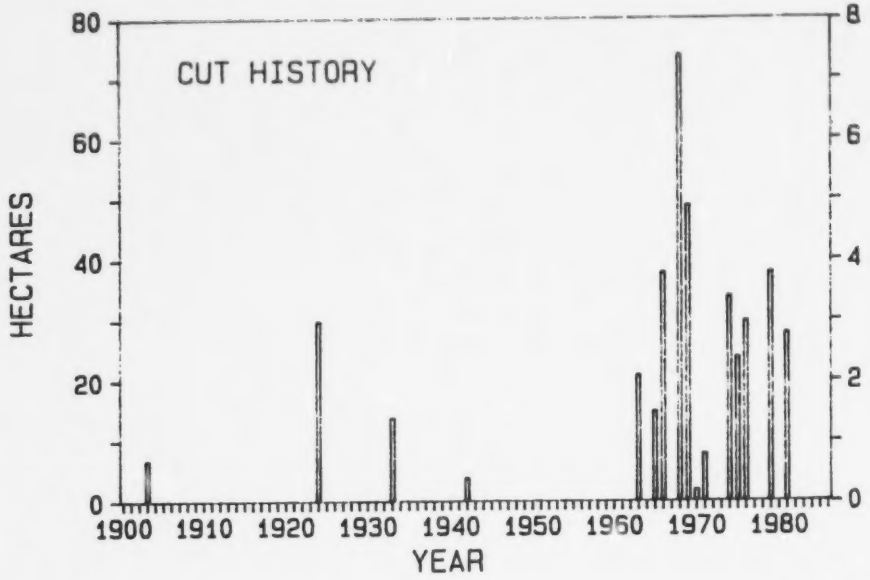


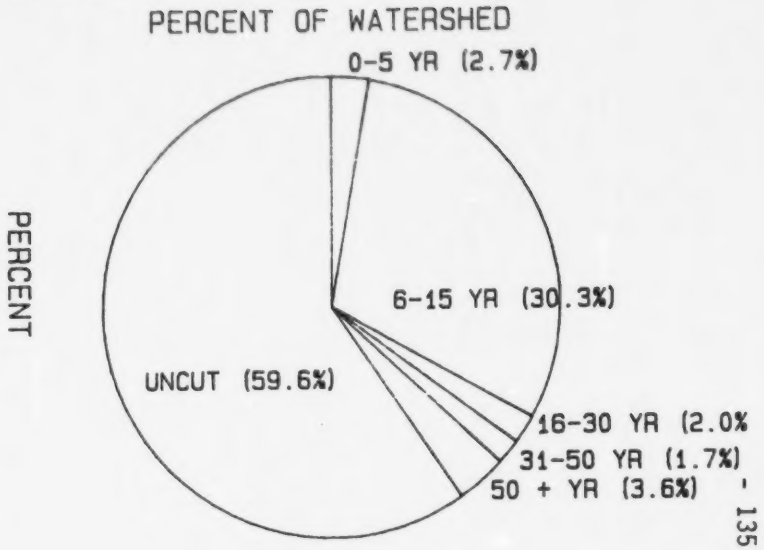


59. Two Rivers East and Two Rivers West have many similar features and may be ideal as co-study streams. Both systems appear to be utilized to their upper accessible limit which is not defined by impossible falls but by insufficient water. In late 70's it was noted there were numerous log jams throughout the system. There may be as many as 8 separate and similar headwater systems that can be studied using both East and West Two River systems.

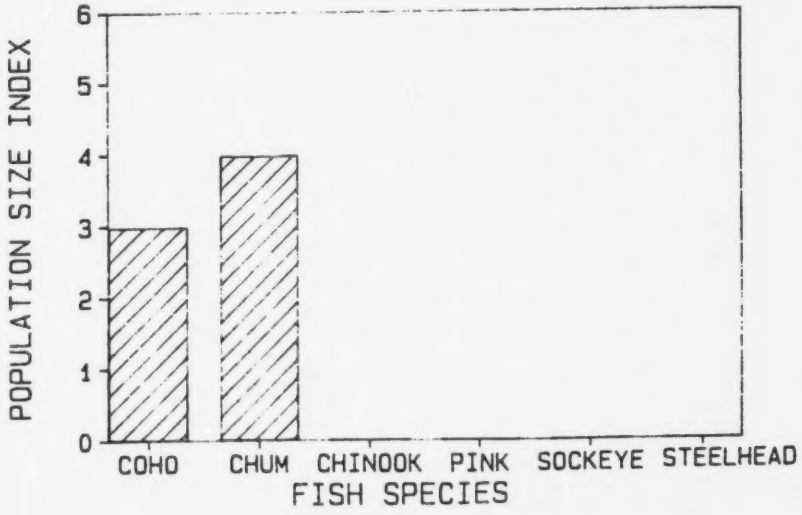
Lower sections contain unlogged control sections as well as sections logged in 1970. Upper sections logged 1966 to 1970.

Two Rivers West

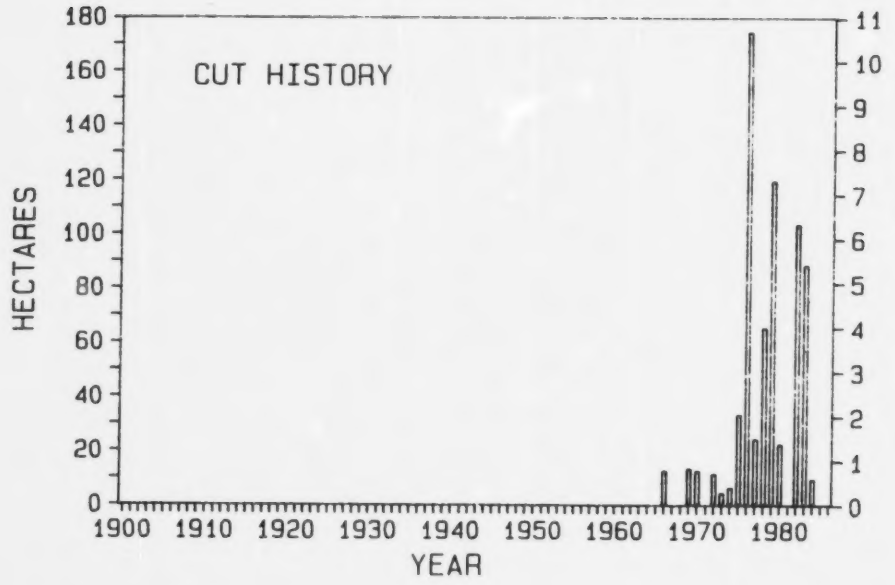


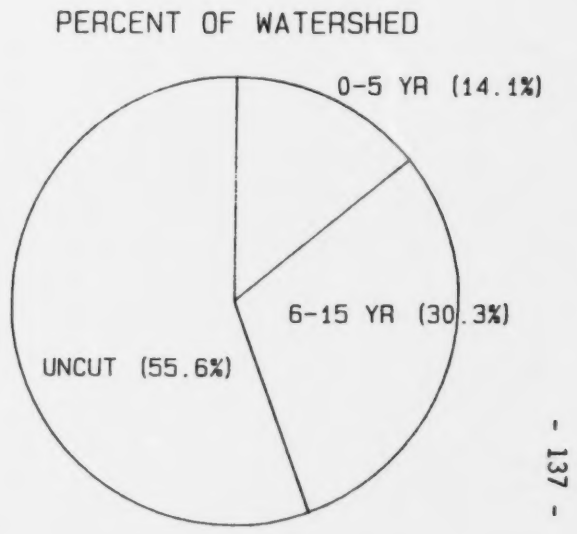


60. Two Rivers West and Two Rivers East have many similar features and might make ideal co-study streams. Numerous swamp areas and intermittent stream on most of western tributary.
An opening along the creek in 1942 of 4 ha as well as openings in 1974 and 1968 may be of interest. There are few unlogged sections along creek to act as controls.

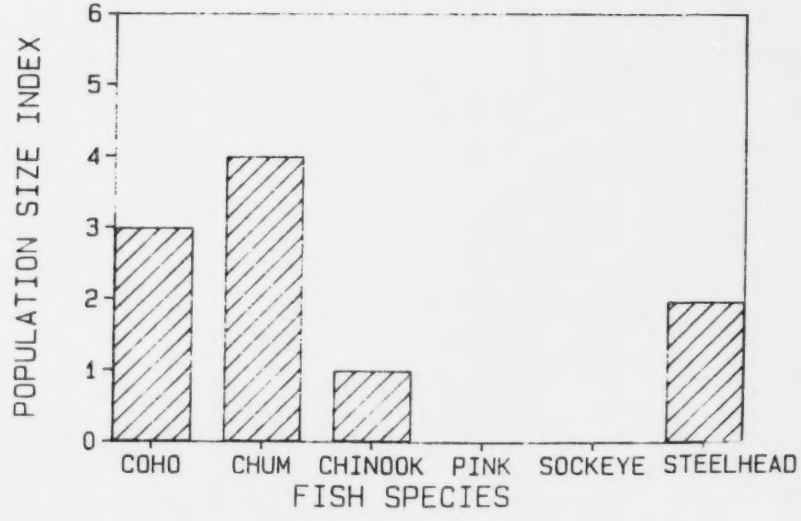


Uchuck Creek

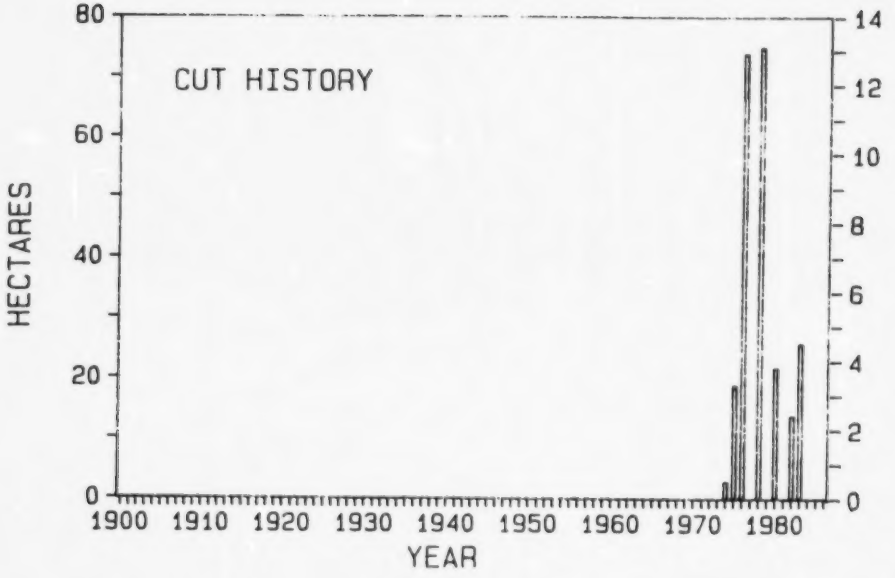


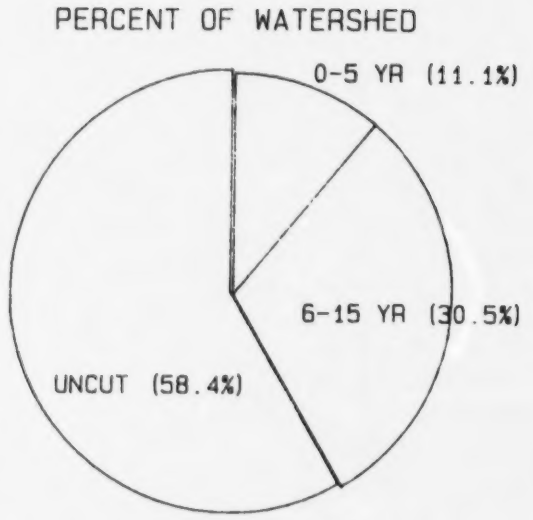


61. Approximately 7% of watershed area is comprised of inaccessible lake. A small second order tributary (3.0 km long) is also well buffered by an accessible swamp system of approximately 5 ha. This may have tremendous study potential as swamp system is buffered by unlogged area. Excellent moorage available at mouth of stream.
Lower section of creek has a buffered section as well as openings in 1976 and 1982. Various openings in late 1970's and early 1980's along lake. Recent logging (after 1984) is also apparant in lower reaches.



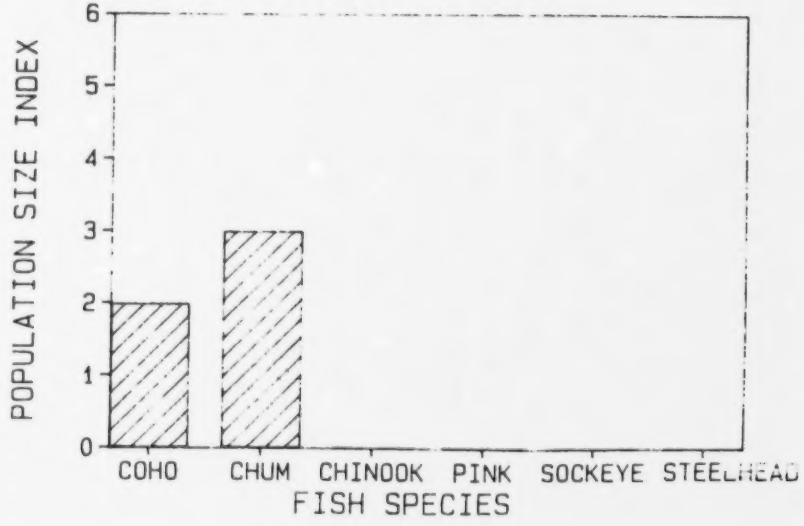
Useless Creek





62. This is not the same creek that is used by the Carnation Creek Watershed Project as a control. Access to this creek is by boat only. There is excellent moorage in the basin with numerous small 1 and 2 order streams (not listed as spawning streams) within 4 to 5 km.

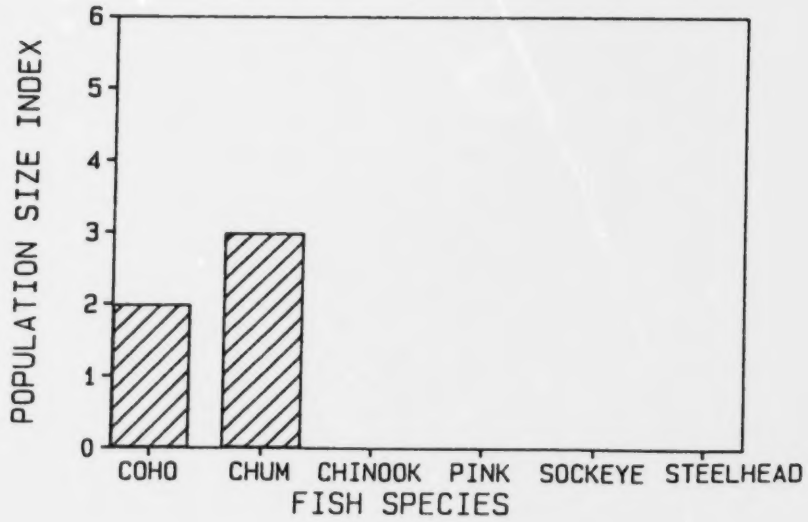
The lower 0.2 km accessible section of stream has an unlogged buffer strip within sections logged in 1982. Some old growth may still be present but this would be below the logged areas.



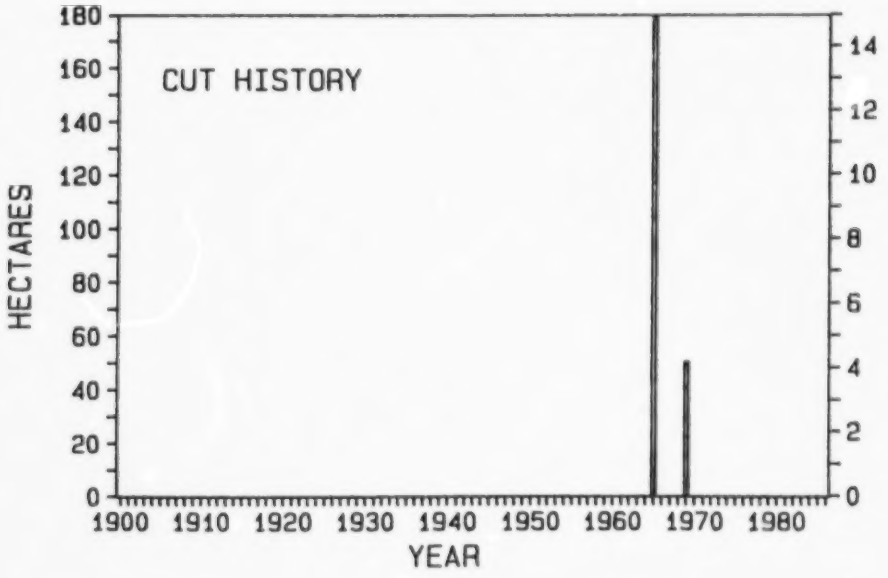
Vernon Creek

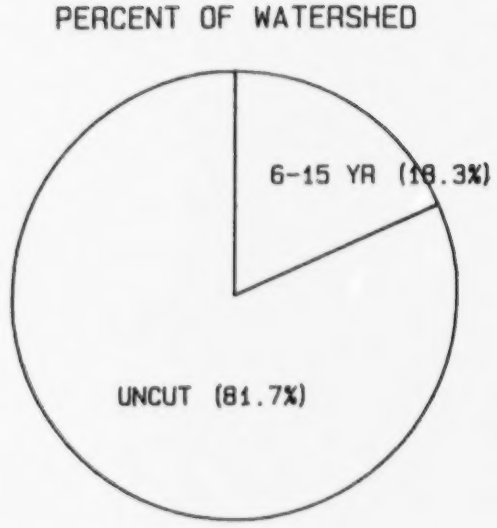
NO LOGGING HISTORY

63. Excellent moorage in Vernon Bay. No roads or logging activity within watershed. May be a useful control stream. Poor access except by boat. Runs of coho and chum are similar in size to those in Carnation Creek.



West Creek





64. Lower 10% in TFL 44 with the remainder in TSA. Much of middle section of creek (above accessible length) had logs yarded down it by caterpillar in the 1960's. Large estuary within narrow inlet may have had a small log dump.